



SATURDAY, FEBRUARY 1, 1873.

Harrington's Power Tapping Machine.

This machine is designed for heavy tapping ordinarily done by hand. All experienced machinists know the difficulty of running a tap "square," with an ordinary hand lever. By bolting or fastening with an adjustable clamp, the work to be tapped to the table of the machine we illustrate, all the difficulty referred to is obviated, as, the spindle being square with the table, the holes are certain to be tapped in the same way. The motion of the spindle is adjusted or limited to any depth desired, at the will of the operator. This is done by the collar at the top end of the spindle, which is held with a set screw in any desired position. The upper collar operates another below it which is loose on the spindle and which is attached to a lever. The latter is connected to a bell-crank below. This moves two steel clutches in the inside of the drum between the gears. These clutches attach and detach the upper and lower bevel wheels to the spindle, one of which revolves the tap in one direction and the other the reverse way.

The table is adjustable by the lower hand wheel shown beside the column. The spindle is raised or lowered by the upper hand wheel attached to the column. Both the vertical and horizontal spindles are made of steel, and the workmanship generally is of the most durable character. These machines are manufactured by Mr. Edwin Harrington, whose address is at the corner of North Fifteenth street and Pennsylvania avenue, Philadelphia.

Equality of Freights.

A correspondent of the *Chicago Tribune* writes as follows on this subject:

The law passed at the last session of the General Assembly, touching equality of freights, was doubtless intended to benefit the State at large, by breaking the force of competition and giving to unimportant points on the various roads equal benefits to those of greater facilities. It is very fortunate for Chicago, however, that it has practically remained a dead letter upon the statute books. The spirit of the act is very laudable, indeed; but, if executed to the very letter, it would work out a state of things widely different from that it was intended to create. Of the need of more or less legislation on the subject of transportation, there can be but little doubt; yet the precise form it should assume is not easily to be determined. So numerous have interests become, and, at the same time, so united, that the framers of a law which is intended to circumscribe the powers of railroad corporations, and regulate their actions, should view the subject from every standpoint, and in every light.

Paradoxical as the statement may seem, we are of the opinion that equality of freights is wholly impracticable from the start. It ignores the first principles of cheap transportation in assuming that added distance increases cost as one mile is to any number of miles, whereas the relative cost is much less. So far from being a move in the right direction it is such a law, that, were its provisions strictly carried out in every State between Chicago and the seaboard, instead of getting first-class goods from New York for \$1.25 per hundred pounds, as now we can, the expense would probably be nearer \$3, in order to prevent a loss on goods carried to proximate points.

To illustrate the effect of the law on the business of Chicago, if strictly enforced, we will give a few figures: Matteson, on the Illinois Central road, is twenty-eight miles from Chicago. The present first-class rate to this point is 27 cents; fourth-class, 15 cents per hundred pounds. Now, if rates to Matteson were reduced to the figure at which profit would cease to result from transportation, we will say, approximately, first-class 15 cents, fourth-class 5 cents, which would be 15-28 and 5-28 cents per mile; at this uniform charge the rates to Cairo would be nearly \$2 for first-class, and about 65 cents for fourth-class freights. Present rates to this point are 85 and 50 cents for the two respective classes. At such disparity in rates how long would the Chicago manufacturer or dealer find custom in Cairo? Rates to Rock Island would be 97 and 32 cents respectively, for the class mentioned. Present rates to this point are 60 cents and 25 cents. With the present pro rata from New York to Rock Island, 30 cents and 8 cents, against the Chicago merchant, would not this new obstacle create a complete embargo to trade? To Des Moines, Iowa, rates would be \$1.88 for first-class, and 63 cents for fourth-class goods, while present rates are 75 cents and 40 cents for the respective classes.

These are only illustrations of the practical workings of the law. It may be objected that the same law would increase through rates from the east to places which would be affected in the manner described, as freights would pass through this State in order to reach their destinations. Such would not be the necessary result, however. The circumstances under which eastern through freights are transported are usually so mutable, as well as secret, in their nature, as to effectually protect the roads from the effect of the law in question. Again, the fact that such freights are not transported in cars owned by the roads over which they pass, in this State, would create an additional protection, as the conditions would probably be considered so widely different from those under which local freights are carried as to create an exception in their behalf.

We are glad to see the question of cheap transportation and non-discrimination agitated, and remedies sought, but while we attempt to correct one form of the evil, we should look well to it that we do not precipitate ourselves into a condition infinitely worse than the first.

American Engineers' Instruments for Japan.

Messrs. Hiller & Brightly have received from the Japanese government, through Mr. Arinori Mori, the Chargé d'Affaires of the Japanese Legation, an order for a complete engineers' outfit for the engineering corps of the Kaitakushio of Hokaido, of Japan—whatever that may mean.

Contributions.**Tools for Trains—Neglect of "Trifles"—Exactness in Gauges.****PASSENGER TRAINS SHOULD CARRY TOOLS, ETC., IN CASE OF ACCIDENTS.**

It is the usual custom on most roads to carry tools in the baggage car for use in case of an accident, but it frequently happens that this car is so badly wrecked or left in such a situation that its contents are inaccessible, and are therefore useless. Many a poor mortal has been doomed to a death of torture for the want of an ax, a saw or a crowbar with which he might be removed from a burning wreck. Men, women and little children are imprisoned or entrapped and held fast in a mass of burning ruins, and stout men are powerless to remove

them. There are some roads on which these precautions are taken, but they should become more general, as fearful disasters may be averted thereby.

After writing the above the appalling news of the disaster at Prospect Station came to hand. In this instance as many as 19 were killed and 17 wounded. The account states that but two axes could be procured with which to cut away the wreck to relieve the victims. The cars fell bottom upward, and there was no way of escape for the imprisoned passengers. One account says: "Some 25 persons were imprisoned and roasted alive." Those outside could render no assistance for want of tools, and the prisoners could not help themselves for the same reason. Doubtless if the cars had been provided with tools, according to the above suggestion, those inside might have effected an escape. It would seem advisable to affix the above mentioned tools both inside and at the outer end of each car. This would insure means of escape, whatever the shape of the wreck. Don't forget a saw, axe and steel-bar at each end of car, both inside and out.

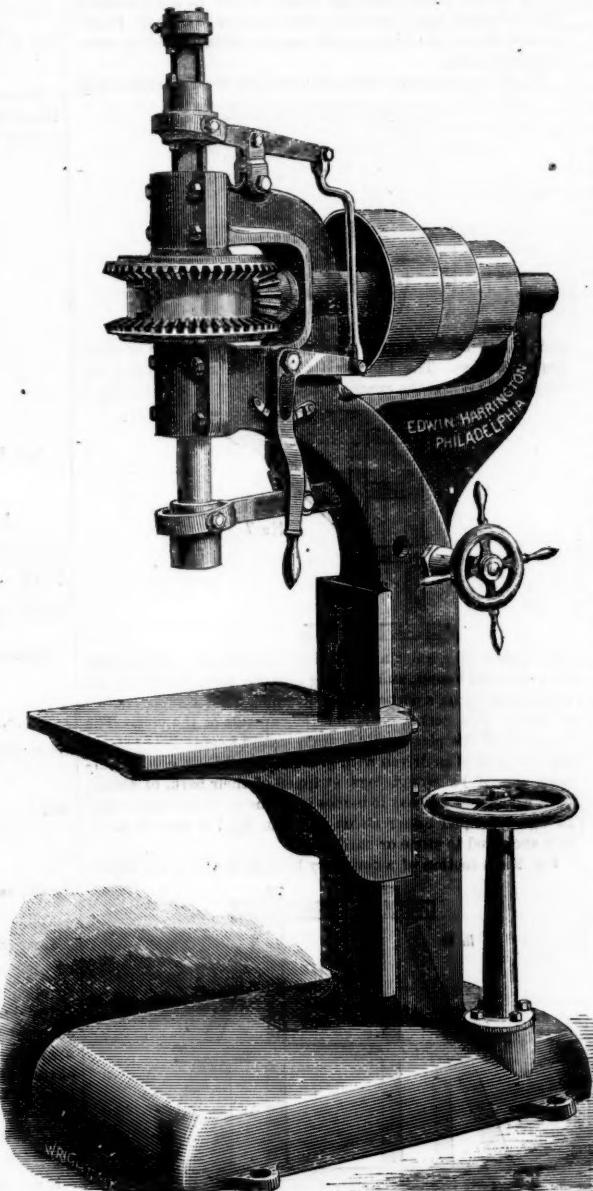
WHAT SOMETIMES HAPPENS FROM NEGLECT OF SMALL MATTERS.

About a year ago the *Railroad Gazette* published an article urging the importance of more strict attention to seemingly unimportant matters in the shop and on the road. The article referred to mentioned the fact that many frightful accidents have resulted from causes that were known to exist, but were considered of too little importance to require attention. It is gratifying to know that the hints and suggestions offered in that and other articles have been acted on by some of the most thorough-going railroad men in the country. This, we may reasonably believe, has in many instances prevented serious calamities.

These conclusions are warranted by the fact that accidents resulting from known causes (and where these causes were apparent for a considerable time previous to the disaster) seldom or never occur on some roads, whereas they continue to be alarmingly frequent on others. There is plenty of truth if not much poetry in the old and homely saying that "a stitch in time saves nine," and in nothing is the truth of this threadbare adage more strongly exemplified than in railroad practice.

This is brought forcibly to mind by the recent accident at Prospect Station. It is reported that this terrible disaster was caused by a broken flange on a tender wheel. How long this tender was run with a broken flange does not appear, but from the readiness with which the cause of the disaster was charged to the broken flange, it is evident that the defect was known for some time previous to the disaster. One account states that the broken flange was discovered before the accident at the bridge, but as nothing definite is known of the matter at this writing, I forbear censure, lest I should be at fault. But if the flange* was known to have been broken before the locomotive started on the fatal trip, it was certainly a criminal act to allow it to proceed, and if the break occurred while making this trip, it was scarcely less criminal on the part of the engineer or conductor to run after the break was discovered. If the break was not considered absolutely dangerous, it might have been advisable to proceed with caution, but it appears that the train was (at the time of the accident) on a descending grade of 85 feet to the mile and not under control. It is too often argued that "if a wheel will run one mile with a broken flange it will run a thousand." But whatever the verdict may be in this case, it is a fact beyond dispute that broken flanges and cracked wheels are sometimes run a little too long, and the result is usually serious.

On one occasion a locomotive was taken into the shop for the purpose of having her drivers turned down, they being badly worn; but it was concluded to run her a while longer, as a matter of economy. The second trip after that she left the track, taking her train with her—run a little too long with worn flanges, as is often the case. Some repaired rails were distributed along the track of a New England road preparatory to taking out some rails that were badly broomed at the ends. The General Superintendent thought some more wear might be got out of them before renewal, and ordered that they remain until further instructions. Result: Two first-class smash-ups in about three weeks thereafter. Another manager was urged to procure ties for renewal, those in the track being thoroughly decayed. He chose to postpone the matter for a few months, in which time the track spread on several occasions with great destruction of property and hindrance to traffic. It cost this company a great many thousands of dollars to economize to the extent of as many hundreds. They keep sound ties in that road now and think they save money by it. They found that trains didn't run well in the ditch. A bridge expert was employed to examine and report on the condition of a temporary bridge. He reported that he considered the structure extremely dangerous. He was afraid to ride over it, and advised the Superintendent to have it rebuilt at once. The Superintendent thought he would risk it a while longer. The wreck consisted of a new locomotive and thirteen cars full of valuable goods, all thoroughly smashed and ruined in the wreck. A locomotive ran into a rock that had come down the slope and smashed her pilot. The pilot was repaired and ready to be replaced, but it

**HARRINGTON'S POWER TAPPING MACHINE.**

them and avert the terrible calamity, and they are compelled to submit to the fate of roasting alive. The sufferings of the victims in such cases are scarcely greater than of those who are free to render assistance, but whose hands are tied for want of some implement by which their release might be effected.

A few days since I saw a passenger train, each car of which was provided with a saw and axe in either end of the coach, the sight of which afforded a feeling of relief at once. Perhaps some very fastidious people would object to riding in a drawing-room car with such unsightly objects in view. But these were ornamented and put up in a style conforming to the style and finish of the car, and in no way detracted from its beauty. The implements are highly finished, and secured in neatly ornamented "baskets" in such a manner as to be readily taken out when needed. To timid and nervous people the sight of such implements might be strongly suggestive of a smash-up and cause uneasiness and alarm, and spoil the pleasure of a journey, but it should have no more effect on such people than the sight of life-preservers in the cabins and staterooms of steamers. But when we consider the great number of lives lost that would have been saved were a saw or an axe at hand, we can but urge the importance of providing all cars with these implements. To these may be added a sharp-pointed steel bar to each car, by which broken timbers may be readily pried apart and entrapped victims released. These and such other implements as may be useful in case of accident may be carried on the palace or ordinary coaches without in any way interfering with the interior arrangement of the car or injuring its appear-

* The truth as elicited at the coroner's inquest and by private inspection seems to be that the flange was not broken but badly worn before the accident occurred and that the immediate cause of the breaking was a seriously defective rail. There may have been no danger from the continued use of the wheel with the thin flange on a track in excellent condition, but great danger on one in bad order.—EDITOR RAILROAD GAZETTE.

was neglected for several days. Some mahogany splinters and the fragments of a cab mark the spot where the cow was on the track. It would have taken about fifteen minutes to have bolted the cow-catcher to its place.

THE IMPORTANCE OF A TRUE GAUGE.

If we go into a machine shop and watch the operations of the mechanics, we shall notice that they aim particularly at accuracy of measurement. We shall see that in fitting up a pair of locomotive driving-wheels the workmen use great care in the gauging, that the flanges may be exactly the right distance apart. In fitting car wheels the same care is exercised, and so it is with all measurements in mechanical operations, the smallest fraction of an inch being regarded as important and indispensable in fitting up rolling stock. There we see locomotives and cars built expressly to run on a track of a gauge of 4ft. 8½in., and this machinery is calculated and measured to a great nicety in all its details. Why then should not the tracklayer be at equal pains to get the track correct in its gauge? If it is designed to lay a track for the locomotive above-mentioned, it is obviously improper to lay it at a width of 4ft. 9in. or 4ft. 8in., or at any width other than exactly 4ft. 8½in. It would be as sensible for a master mechanic to turn out a locomotive a ½-inch narrow or wide of its gauge, as to lay the track with that much variation from a true measurement. Yet if this was done it would be called an act of great stupidity, carelessness, or perhaps criminal neglect. At all events, he would be dismissed for incompetency, whereas the tracklayer can "put in all the variations" with impunity, and this is one of the evils of rapid railroad construction. This variation is the direct cause of many frightful accidents, and yet there is hardly a road on the continent but is more or less (usually more) out of true gauge.

The writer has been led to these remarks by the occurrence of several accidents which recently came under his notice on a new road which were caused by the track being too narrow in its gauge. The track was new, and supposed to be one of the best laid tracks "on the continent." Three derailments occurred at a single point on the line, and on investigation it was clearly proved that the track was from one-half to three-fourths inch too narrow at the place where those accidents occurred. A further examination of the line revealed the fact that much of the track is in the same condition, and trouble may be expected from that at any time, unless the track is spiked over to a true gauge. Here is an instance of a company sustaining a loss of several thousands of dollars, all of which would have been saved by the exercise of a trifling amount of care in the use of that very simple implement—the gauge.

This is not a solitary instance of the kind; but a great deal of mischief is caused by inaccuracy of gauge. Not only new roads, but those that have undergone extensive repairs, have been found wanting in this respect, when the gauge was supposed to be correct. Laying track and keeping it in repair may be regarded as a mechanical operation, and accuracy should be aimed at on the road as well as in the shop. The interests of the railroad shareholder demand it, and the traveling public have a right to raise up their voices in this matter.

W.M. B. HUNTINGTON.

Practical Field Engineering.

NO. XIV.

TIMBER WORK ON RAILROADS.

It is the purpose of the writer to give in this chapter to the young engineer, by means of cuts and explanations, an understanding of the principal timber structures used in the construction of railroads. If the proper attention has been given to those papers of this series treating of culverts, cattle-guards and cross-ties, in connection with the general idea of timber-work given in the chapter preceding this, the plans now submitted and explained will be easily understood.

Fig. 1 is a cross-section of the kind of timber drain or open culvert used where the embankment through which the water



is to be let is not more than two feet high. The logs that form the side of the culvert are hewed on two sides. Their cross-section is 12x15in. They are placed on mudsills, to which they are spiked. The stringers, 12x16 in., are cut down at each end so as to form a shoulder of four inches to abut against the cap or top logs, which is here adzed flat to receive them. The logs should be two feet longer than the base of the embankment, so as to give a clear water way.



No. 2 is a cross-section of a closed culvert of logs. It is used where the volume of water to be transmitted is small, and where the embankment is sufficiently light to admit of repairs without great trouble. The logs should be hewed on two sides, with a cross-section of at least 12x15in.

Fig. 3 is a section of a bent for an open culvert where the volume of water to be passed is considerable. A A are the batter posts or braces, having a slope of four inches base to one foot perpendicular. It will be seen that these braces do not meet the plumb posts at their juncture with the cap-sill. They are thus set out a foot or more to give a better support to the



8-inch planks that are to be spiked on, as seen in fig. 4, to keep the embankment from sliding in and filling up the opening.

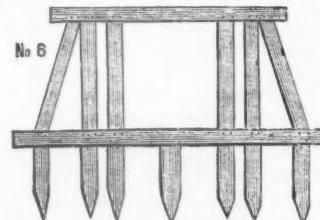
This is used (in embankments or over stream-beds under surface grade) from three to six feet high. Of course the stream must be such as can be spanned at high water by using stringers not over ten feet long.

Fig. 5 is the simplest form of bent for trestles from 6 to 30

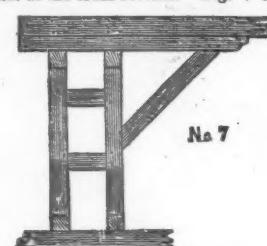


feet high. The timbers for this and the bent represented in No. 3 are hewn square with a cross-section of 12x12in. Braces have a slope of ½ to 1 in bents from 6 feet to 15 feet high, and a slope of ¼ to 1 when their altitude is from fifteen to thirty feet. These bents, when in place, should be 12½ feet apart. The stringers, upon which the cross-ties are to be laid, should be hewed on four faces, and the cross-section should be a rectangle 12x14in.

Fig. 6 is a section of bent, two of which when placed parallel

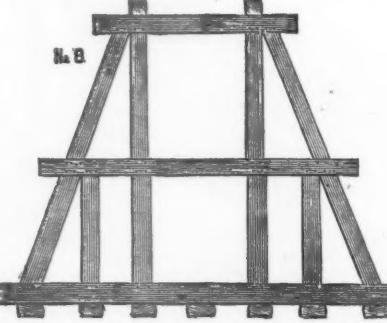


and 3 feet apart form a good pier for a Howe-truss or other timber bridge. The timbers for this bent are hewed to a rectangle 12x12in. at the cross-section. Fig. 7 is a side view of



the timber pier, showing how the two bents are tied together by horizontal braces, and showing also the lower chord of the bridge resting on a corbel, or longitudinal bolster supported by a brace. The corbel rests on the cap-sills of the pier. The base-sills of the pier should rest on a solid foundation of stone, hard clay, or piles driven with great care. Piles for this purpose should be round logs stripped of their bark, of sound, hard wood, and at least 15 inches in diameter at the upper end. In fig. 6 the pier base rests on piles; in fig. 7 it rests on mud-sills anchored to stone or hard clay.

Fig. 8 is a section of a two-story bent used where the trestle



is much over 30 feet high. The timber of the lower story is 14x16in. at the cross section, that of the upper is 12x12in., or 12x14in. Such bents, when placed 12½ feet apart and well braced longitudinally, form a rigid and durable trestle. Stringers 25 feet long and 12x14in. at the cross section are the best.

In making your calculations for the height of your bents, be sure that you get the distance from grade down to a solid foundation, which, it may be remarked, is not often on the ground surface.

Cross ties used on trestles and bridges should be selected with great care, so as to have them of uniform thickness.

When the timber pier (see figs. 6 and 7) stands in the current of a stream, a clump of piles may be driven to high-water mark on the up-stream side of the pier, to protect it from drift and the force of the water in times of freshet.

It is the business of the field engineer to see the piles driven; or, if he cannot be present all the time, he should employ a trustworthy assistant for the purpose. Piles are worse than nothing if not firmly driven.

HOOISTER.

Locating Frogs.

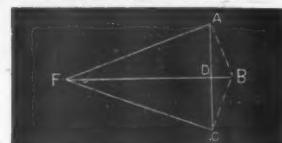
TO THE EDITOR OF THE RAILROAD GAZETTE:

From time to time I have noticed in your columns formulae for locating frogs, etc.; and as I have been in the habit of using for the purpose formulae which are very simple, I here-with send you a few of them, and would be glad to hear of any more simple.

To other advantages may be added that they dispense with trigonometrical tables.

Let ABCF represent a frog, as it is in practice. For my pur-

pose I shall take that part of it, ACF, omitting the part ABC.



Then FD is the length of the frog, and AC its width. AFC = F = frog angle and

$$\tan \frac{1}{2} F = \frac{AD}{FD} = \frac{AC}{2FD}$$

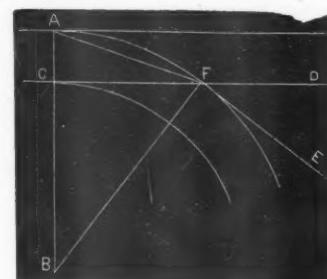
whence

$$\cot \frac{1}{2} F = \frac{3FD}{AC}$$

This result of $2 \times \frac{FD}{AC}$ I shall write $2 \times n$, where n = number of frog = $\frac{FD}{AC}$ = ratio of length to heel.

$$\therefore n = \frac{1}{2} \cot \frac{1}{2} F$$

I take more room for the above than I otherwise should, as its use below has often been termed approximate by those who should know better.



Now for our formulae:

$$EFD = F = \text{frog angle} = 2CFA$$

$$\therefore CF = CA \times \cot AFC = 2gn$$

$$AF = \frac{g}{\sin \frac{1}{2} F}$$

which, by obvious trigonometrical reductions and substituting $2n$ for

$$\cot \frac{1}{2} F = g/\sqrt{1+4n^2}$$

which can be taken equal to $2gn$ for practice; but correctly,

$$AF = \sqrt{1+4n^2}$$

Again, from the figure,

$$BF = r + \frac{1}{2}g$$

$$BC = r - \frac{1}{2}g$$

$$\therefore \cos CBF = \cos F = \frac{r - \frac{1}{2}g}{r + \frac{1}{2}g}$$

from which,

$$r = \frac{1}{2}g \left(\frac{1 + \cos F}{1 - \cos F} \right)$$

But

$$\frac{1 + \cos F}{1 - \cos F} = \cot^2 \frac{1}{2} F$$

or,

$$r = \frac{1}{2}g \cot^2 \frac{1}{2} F$$

Again, as

$$\cot \frac{1}{2} F = 2n$$

$$r = 2gn$$

Inversely, if r is given:

$$n = \sqrt{\frac{r}{2g}}$$

The lengths of switch rail on either side of the turnout curve, theoretically, are not the same, but the difference is next to nothing. The length of switch rail on the center line of track will be a mean between them; and this length, denoting the opening of switch rail by o , is

$$l = \sqrt{2ro} - \sqrt{2(2gn) - 2n\sqrt{og}}$$

Whence the distance from the headlock to the point of frog

$$= 2gn - 2n\sqrt{og} - 2n(g - \sqrt{og}) = H$$

If you are putting turnouts on curves, the values given by the preceding will answer, with the exception of r . Omitting the discussion, I will simply say:

If the turnout is on the inside,

$$r = \frac{(2R - g)gn^2}{R + 2gn^2}$$

where R is radius of main track, and r of turnout; and if on the outside,

$$r = \frac{(2R + g)gn^2}{R - 2gn^2}$$

In these last two we can omit the term g^2n^2 in the numerator for approximate values.

Now, suppose

$$g = 4.7 \text{ feet}$$

$$o = .43 \text{ feet}$$

For any curve our formulae will be:

$$CF = 9.4n$$

$$AF = 4.7\sqrt{1+4n^2}$$

$$r = 9.4n$$

$$n = \sqrt{\frac{r}{9.4}} = .323\sqrt{r}$$

$$l = 2.81n$$

$$H = 6.69n$$

On curves,

$$r = \frac{(2R - 4.7)4.7n^2}{R + 9.4n^2} = \frac{(9.4R - 22.09)n^2}{R + 9.4n^2}$$

for the inside, and

$$r = \frac{(9.4R + 22.09)n^2}{R - 9.4n^2}$$

for outside.

For this gauge and switch opening, therefore, our constants are determined, and our tedious operations are very simple.

Casually glancing at "W. M. B. H.'s" article, which would give

$$AF = \sqrt{2rg} - \sqrt{2g^2gn^2 - 2gn}$$

$$CF = 2gn$$

we see it is due to his omission of $\frac{1}{2}g$ in the first term of his first proportion, which would give him

$$R + \frac{1}{2}g : \frac{1}{2}AC (\text{or } AF \text{ in fig. 2}) :: AC : g \\ \therefore \frac{1}{2}AC^2 = g(R + \frac{1}{2}g)$$

or

$$AC = \sqrt{2g(R + \frac{1}{2}g)} = \sqrt{g(2R + g)}$$

The error is, however, immaterial in practice.

Some other time I may give you rules for three throws, but at present I have encroached enough on your valuable columns.

T.

Railroad Management—Notes and Queries.

TRAIN DISPATCHING.

In May last one "S." of Galesburg, Ill., intimated that the station "to" station dispatching system brought forward by me would prove too much for the wires, and his calculation was as follows: To get 25 trains over 20 stations in 12 hours would require not less than 25,000 words, or say 2,000 words per hour, which performance is impossible. I mildly suggested that, accepting the calculation of "S." as to the number of words required, and dividing that total by the number of stations, 20, the result was 105 words, or less than five minutes telegraphing at each station in the 12 hours; that is, supposing each station to do an equal amount of work. "S." in his reply preferred not to understand my modest figuring, and after much sarcastic but useless verbiage tells us that "25,000 words cannot be telegraphed over one wire in the time and under the conditions stated." I have not hitherto replied to "S." because I concluded that he knew very little of the subject malgré his fling at my supposed want of telegraphic skill, and also because I waited patiently those "other objections" that were to be "presented in such rapid succession" as to knock me out of time. Perhaps "S." having discovered that he alone fixed the conditions of one wire and a circuit of 125 miles, and that I was no party to such limitation, is now ashamed of himself. I forgive him his youthful intemperance and solicit the favor of those other objections. The number of wires necessary and the smallness of circuit may be important items in estimating the expense of my system, but can be no insurmountable obstacle.

ACCIDENTS AT RAILROAD CROSSINGS.

These accidents as reported are far too numerous, and apparently in each case the result of gross carelessness. Would it not be an improvement to guard these crossings by distant signals, so arranged that the raising of one lowers the other and vice versa; then give one road the right to pass unless the signal be against it? The signals for that road will therefore be normally down, and for the other road be normally up. Such an arrangement would prevent all collisions but those caused by the wilful conduct of an engineman running against signals. It leaves no room for a misunderstanding of signals.

SEAL LOCKS FOR FREIGHT CARS.

Quite a number of roads use this description of lock, some with the common lead seal, others with the patent photographed glass seal; but I know of no road that uses them for the detection and prevention of pilferage. As protectors they are worthless; any one can break the seal and open the lock. As detectors they are valuable, if a proper system of noting the seals and inspecting them be adopted. This matter is worthy of attention from general freight agents.

THE WHISTLE NUISANCE.

The screaming and shrieking of locomotives at highway crossings has been so much complained of lately that some new device for giving warning of the train's approach is called for. In the meantime, an old device might be profitably adopted on those roads running through a thickly populated country; viz., a bell on the front of the engine, the tongue of which is moved by a crank attached to the axle. The bell is constantly ringing, and to the accustomed ear indicates the speed at which the train is moving, with the distance it is from the listener. The sound travels along the track in front of the train a considerable distance, sufficient to give ample warning, yet not sufficient to wake the sleepers. The sound is continuous, and therefore a better warning signal than a few puffs of a whistle.

STATION SIGNALS.

In every railroad station the observer may notice one or more signal posts known as semaphores, and would naturally conclude that these semaphores must act a very important part in the management of trains within the station limits. I confess that I do myself look upon these signals as very important ones and that I think their operation should be regulated by well understood rules. It seems, however, that at least 70 per cent. of American railroads do not consider it necessary to lay down any rules regarding the working of semaphores, and my observation of the practice on different roads satisfies me that superintendents might with advantage turn their attention to this subject.

TRAIN-ORDER SIGNALS.

The practice varies considerably on different roads regarding the color and position of "train-order" signals. On some roads the signal remains normally "off," leaving the line clear for the passage of trains until an order is received from the train-dispatcher for some train. This practice is bad, because the operator might forget to turn the signal on; whereas if the normal position were "on" and he neglected to turn it off, no harm could result beyond slight detention to the train. Various colors are used; some roads use white, some green and many red. Red is not the best color, as an order signal should not be a danger signal. It might be necessary to stop the locomotive before it could reach the platform, yet a red light shown for that purpose might be mistaken for an order signal and the train might come on past the platform.

WESTERN AND SOUTHERN RAILWAY ASSOCIATION.

If this Association is for the discussion of matters connected with the management and practical working of railroads, why do they not admit assistant superintendents, chief engineers, general freight and ticket agents? The roads could be bound in agreement and compact only by the chief officer; but the

debates and expositions of railroad principles could not but be enhanced in value by the assistance of the departmental officers.

ADVERTISING AD LIBITUM.

The Chicago & Alton Railroad, having adopted as its motto "The only first-class road in the West," is striving to keep up its reputation by supplying the general public with first-class literature. Perhaps it is no business of mine if any particular corporation chooses to throw away its money; but I cannot help noticing this as a new and alarming feature of modern advertising. Railroad advertising had already been pushed to the absurd extreme when this new and more useless extravagance was hit upon. The print is too small for reading while in the cars. Those who were expected to rush for the guides that they might detach the works of Robert Browning and bind them when completed will no doubt find it more convenient and no more costly to buy the completed works at some bookseller's store. Had Mr. Charlton secured the services of Ned Buntline, Louisa Alcott, Professor Tyndall, Henry Ward Beecher and Mark Twain, and published for free distribution a literary *olla podrida* calculated to suit the tastes of all classes of society, his guide might perchance magnify the number of those who know that such a road as the Chicago & Alton suits, though it may not swell the net earnings. Perhaps the Illinois Central will take this hint.

WHAT IS IT?

Will some Kansas Pacific man rise to explain the following rule:

"60. Trains may be held through station agents (or operator, at a point where there is no agent) by personal order of the Division Superintendent, and in no other way, in cases when, by reason of detention or accident, the orders cannot be directly communicated to the conductors and engineers; provided that orders to the same effect shall be sent for the conductors and engineers also, to be responded to on their arrival at the station."

MILE POSTS.

Would it not be an improvement if mile posts showed the distance from next station as well as from the end of the road. The extra expense would be trifling or nothing. HINDOO.

Need of a Clearing-House System for Through Freight Business.

[A freight manager of great experience writes to us in a private letter of some matters which deserve more general consideration and discussion, and we therefore take the liberty of publishing a part of his letter.—EDITOR RAILROAD GAZETTE]

"What we need more particularly is a *better system* for doing the business and for settlement of accounts between the roads, so that a continuous route between the great centers of business to the West and East, where the traffic passes over several different companies' roads, shall be conducted as one road, without the hinderance or interruption of billing the goods from one company to the other, but the entire route be covered by one way bill, and all competing routes governed by the 'clearing-house' plan—settling each roads proportion of the traffic for freight with the Freight Auditor of each road, and for passengers with the General Passenger Agent of each road. * * *

It is only a matter of time to bring about the adoption of this system, or something similar. The unfortunate part of our whole railroad management is, that the great lines are in the hands of parties who are so overtaxed with the magnitude of their business, together with the other fact that they have had but little if any experience in the detail work of the business, that they do not give the time and attention to this subject that its importance demands. Therefore we continue the old system, which is as far behind the times as the old system of 'chalking trunks' from one road to another instead of checking them through."

"If the *whole* business can be done under one system through the 'clearing house,' with two hundred clerks in one place where all lines keep good faith with each other, it would certainly be better than employing *two thousand* clerks and expensive agencies all over the country at ten times the cost to settle with connecting roads and rebuild the property, while the cars and goods are waiting on some side-tracks in the yard for such bills, and while the 'agents' of each line are busy in granting *free passes*, or tampering with the agents of 'freight protective unions,' or cutting rates to gain some advantage over a rival line, or allowing some large shippers on some side road to load 25 per cent. more freight into a car than is billed out. None of these are responsible to any one except the officers of their own road. The short line having little or no interest in the business, the main through lines suffer in consequence of the want of a practical system to make all through business uniform, under a *united* management, when each line and road shall be held responsible for its action as well as the action of its agents. This system, while it *permits* each line to do its own business and employ its own agents, and to continue its contracts with 'dispatch lines,' yet makes *all* comply with the *uniform system*, and while their business may be continued it brings all under the 'clearing-house' system, to carry out in good faith the rates and to conform to their contracts with the road as well as with the public."

Western and Southern Railway Association.

At the annual meeting in St. Louis, January 15, Mr. Thomas Allen, the President, presented the following annual report:

PRESIDENT'S REPORT FOR 1873.

ST. LOUIS, January 14, 1873.

To the Members of the Western and Southern Railway Association:

GENTLEMEN—This is the first anniversary of our Association. On the 16th of January last year, 29 officers of Western and Southern railroads met here and organized the Society. The

number was 83 members of 73 different roads. One officer, L. Burnett, Superintendent of the Sioux City & Pacific Railroad, has withdrawn from membership, and seven became ineligible by retirement from the qualifying positions they held. One member has been taken by death, Major Firth, of the Atchison & Nebraska Railroad, who was killed in an accident on his road.

The Association has held three quarterly conventions; but it having become apparent that the members as a class are too much employed to spare time for attendance so frequently as every three months, a resolution will be brought forward today to limit the number of meetings to two yearly, and to change the title of the Association, giving it a broader and more comprehensive grasp. We hope to include in our list of members officers of every railroad in the United States and Canada.

As yet, although the discussions and comparing of personal experiences have been of value to the members taking part in them, but little has been accomplished in the way of action. Locally, we of St. Louis have gained considerably by an agreement that we came to at our first convention, by which we agreed to insert no paid advertisements in the local papers and not to pay for time-table insertions more than a small fixed sum. Also we agreed to take runners off the streets. By this understanding the roads centering in St. Louis have retrenched a useless expenditure of thousands of dollars.

Final action was taken as to the standard height of draw-bars. It was decided to adopt the recommendation of the Master Mechanics' Association, viz., 32 inches for railroads north of the Ohio River and 30 inches for those south of that line. A number of railroads have signified their intentions to conform to these heights.

At the first meeting, it was proposed that Congress be applied to for a charter, but the resolution was reconsidered and a charter has been deemed unnecessary.

Several important subjects have been under consideration during the year, reports on which from the committees having them in charge should be laid before you to-day. Two of the most important have engaged the attention of members from the inauguration of the Society, but as yet have found no practical solution. I allude to the system of free passes and commission on the sale of tickets. These subjects are of great and growing importance to railroad interests; their abuses are multiplying so fast that the burden already grievous must soon become unbearable. Where so many antagonistic interests are involved, a settlement is necessarily difficult to arrive at, and although a whole year has been spent in mere discussion and futile attempt to control this evil, I think, gentlemen, that there is no reason to slacken our efforts. During the year, in the threshold of which we are now standing, the influence of our Association will be more widely extended and united action possibly more practicable.

It may not be out of place to remark here, that this Association is essentially a deliberative body, and that action should not be determined on until after thorough and exhaustive discussion. A desire for action is natural to men engaged in executive occupations such as are the members of this Association; but, in order that all points of the question may be received and argued, and in order that the opinions of the whole body may be elicited, it will be well to hasten slowly.

It was found that the members were so busily engaged in their important duties that any extra official work became inconvenient, and also that they were liable at any time to become ineligible for membership by changing from one official position to another, and that therefore a Secretary chosen from among the members could never be permanent. To avoid the inconvenience of repeated changes in the office of Secretary, a paid Corresponding Secretary was appointed on November 1, who resides in St. Louis, and at all times is available as a medium of communication between the members.

It is proposed to gather together such statistics and information as may be of further use; the Secretary has therefore been instructed to address a circular to all the railroad companies, and other individuals who may possess such information, which will be kept in the Secretary's office at St. Louis, carefully compiled and accessible to all members of the Association.

The expenses of the year were \$609.88. An assessment has been made of ten cents per mile on the roads belonging to the Association, from which the above expenses were defrayed, leaving a sum of \$486.82 in hand, and \$1,100 (estimated) yet to be collected.

The constitution provides that the officers of the Association shall be elected annually at the January meeting, by ballot; you will therefore, gentlemen, on disposing of this report proceed to select your officers for 1873.

RESOLUTIONS.

The following are the resolutions passed concerning the change of name, etc.:

WHEREAS, The Western and Southern Railway Association was formed to discuss matters of railroad management, with a view to the improvement of such and to the safer and more economical working of railroads, and to procure the adoption of such rules, regulations and agreements as might be found necessary or desirable for the benefit of the railroad interest; and,

WHEREAS, Such purposes are not of local importance merely, but are of common interest to all railroad officers and proprietors; and,

WHEREAS, Some of the purposes cannot be properly carried out by any local society or societies; therefore, be it

Resolved, 1st. That the title of the Association be hereafter, the "RAILWAY ASSOCIATION OF AMERICA."

2d. That the Secretary be instructed to notify all persons, eligible for membership, of such change, and to invite them to become members.

3d. That Article 5 of the Constitution be amended to read, "The Association shall hold two regular meetings each year, on the second Wednesday in May and October. The places of holding each meeting shall be designated at the meeting immediately preceding. Special meetings may be called by the Executive Committee."

Confession of a Train Wrecker.

An Eastern exchange of last week says:

"Thomas Nelson, who was arrested on Monday at Easton Centre for placing obstructions on the Old Colony Railroad at White's Crossing on the 6th of November, was taken before Trial Justice Roach of Easton on Tuesday, and waiving examination, was bound over for trial at the March term of the Superior Court in Bristol County. He made a full confession, stating that on the 6th of November, in company with another man, he ate dinner at the poor-house in Easton, and then went to the Easton station. After stooping there until about 5 o'clock, they started for North Easton on the railroad track. Both had been drinking considerably, and when near White's Crossing they saw two rails beside the track, and for the fun of the thing put one of them on the track. Without stopping to see the result, they went on toward North Easton. Nelson going to his home in Easton Centre, and not knowing the result of their work until the next morning. The result was that the steamboat train for New York, which left Boston at half-past 5, struck the rail at the crossing and damaged the engine so as to cause an escape of steam, which injured the engineer so that he was confined to his home for over two months. He saved his life by crawling through the cab window. No one else was injured, although there were about 500 passengers on the train. Nelson is about 22 years old, and is a woodchopper employed on the new road which the town was building, and had been discharged the day when the lawless act was committed."



PUBLISHED EVERY SATURDAY.
A. N. KELLOGG & CO., PROPRIETORS.
S. WRIGHT DUNNING AND M. N. FORNEY, EDITORS.

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Editorial Announcements.

Correspondence.—We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Inventions.—No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns our own opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

THE WESTERN FARMERS AND THE RAILROADS.

For a few months past the farmers—more particularly the grain growers, and most particularly the corn growers—of the West have been complaining bitterly of the cost of getting their produce to the consumers. The prices of grain, and of corn especially, are lower than for many years previously; after using it most lavishly for feeding and fattening stock, an immense surplus remains, which in places far distant from the Lake ports brings a mere trifle, and naturally and properly the farmers, and the merchants and manufacturers who are supported by the agricultural industry, including we might say almost the entire population of the prairie States, are inquiring eagerly into the causes of these low prices, with the hope of finding some remedy. They find very readily that the price of corn in New York is rather more than twice as great as in Chicago, and that the cost of carrying a bushel of corn from Chicago to New York at this season is more than its price in the former place. The difference is greater, of course, for points west of Chicago, and nearly all of it is caused by the cost of transportation. Cheaper transportation is seen to be the desirable thing, and cheaper transportation is demanded by farmers individually and in convention, and their cry is echoed by the press. It seems to be assumed that the needed relief, which will advance the price of corn ten or fifteen cents a bushel, depends wholly upon the railroad companies, and that simply by a reduction of profits, now extravagant, to a reasonable amount, this very desirable advance in the price of grain can be secured.

Now it is perfectly proper that this question of transportation should be investigated; that farmers and others should learn just how great a tax the price of transportation is, and how large a proportion of the transportation charges are profits to those conducting the business.

We do not find, however, that there has been any serious investigation, either by the farmers or the journals which espouse their cause so warmly, and the result of the agitation hitherto seems to be great heat and little light. Most speakers have contented themselves by showing how much more it costs to carry a bushel of grain from Illinois or Iowa to New York than the farmer gets for it, without any attempt to show why the cost should be less. That is, they have contented themselves with pointing out the desirability of cheaper transportation, without attempting to prove its possibility. Most newspapers have given as the chief obstacle to

much lower freights the undue profits of railroad companies, and have enlarged on the watering of stocks, etc. Only one instance have we found in which any attempt has been made to show how much rates might be reduced by a decrease of the companies' profits.

A correspondent of the *Chicago Inter-Ocean*, writing from Springfield, Ill., has contributed to that journal a long letter on the profits of railroads and the taxes which they pay, in which a plentiful use is made of figures from the report of the Railroad and Warehouse Commissioners and that of the Auditor of Public Accounts. This array of figures is likely to cause many to look upon the letter as an honest study of the subject, and its conclusions as trustworthy. But besides some grossly unfair assumptions (such as estimating the actual cost of the railroads in operation as less than \$25,000 per mile), there are other applications of figures which are so manifestly and grossly incorrect as to make it hard to believe that the article was not prepared "with intent to deceive."

For instance, having assumed that the actual cost of the railroads is only \$25,000 a mile (instead of \$42,264, as reported), the writer inquires what would be the increase on this assumed cost if the receipts from freight should be reduced one-half. To do this he takes from the Railroad Commissioners' report the following statement of the aggregate gross receipts of the railroads of the State for the year ending June 30, 1872:

From freight.....	\$30,074,594
From passengers.....	10,155,164
From mail, express and miscellaneous.....	2,997,669

Total.....\$43,227,427

This being from 5,381 miles of road. The working expenses incurred in earning this amount were 65.6 per cent., or \$28,357,191.

Now, the writer referred to finds that if the earnings from freight had been less by one-half, the gross earnings would have been \$28,190,130, and then he gravely subtracts 65.6 per cent. from this to find the net earnings from these gross receipts! Of course the reduction in rates could make no reduction in the gross amount of the working expenses, which, it will be seen by the writer's own figures, would be \$167,031 more than the receipts! That is, with the freight rates reduced one-half the railroad companies not only could not pay 8.5 per cent. on their assumed "actual cost" of \$25,000 per mile, but could not pay a dollar on the interest on their bonded debts (which amounts to something like \$8,000,000 yearly), and not even quite meet their working expenses! The *Inter-Ocean's* correspondent has in truth made a true *reductio ad absurdum*, and nothing could so clearly show the impracticability of greatly reducing the freight tariffs.

But let us go a little further in the path into which this investigator has taken us. Taking his own figures, including the grossly untrue assumption of the average cost of the railroads, let us see what change in the freight tariffs would afford the railroad a net income of 8½ per cent. on \$25,000 per mile. This would be a total, for the roads reporting, of \$11,329,246, which is less than the net income reported by \$8,542,990. Now if we take this from the freight receipts only, it will make a reduction of about 11½ per cent.—which, we need not say, would hardly relieve the necessity of the corn growers (who are most affected by freight charges) as it would not make a difference, on an average, of one cent a bushel in the rates on that grain, and not all of that—more probably in the existing condition of the demands, not any of it—would go to the farmers, but to the consumer rather.

Taking the railroads at any fair valuation, however, and the net earnings of 1871-2 reported to the Commissioners were not more than 7 per cent. on the investment, and this in a State where loans on mortgages with the very best security are very rarely made for less than 9 per cent., and usually for 10 per cent. Hardly a farmer in the State will lend his money (when he has any to lend, as many of them have) for less than 10 per cent., and we do not believe that farmers or others really would ask the owners of railroads to take less than 7 per cent. on their investments, if they knew it. It is a false idea of the profits of railroads which leads them to regard the companies' charges as unjust and extortionate.

But these are Illinois railroads, comparatively new and many of them as yet barely earning the interest on their bonds. At least they do not, or very few of them do, affect the cost of transportation between Chicago and the East, and it is these roads which are most charged with extravagant profits, with enormous watering of stock, and with charges which, more than any others, keep down the prices of grain in the West. Now we shall not deny that stocks have been watered, and that in some instances the profits on railroad investments have been very large. But this by no means proves that but for these large profits the price of transportation would be very much less. How much do the profits of stock-

holders affect the charges, is the question; and this question we purpose now to investigate.

Let us, then, inquire just how far rates could be reduced if no dividends should be made to stockholders, and gross earnings be made only large enough to cover the expenses and the interest on the bonded debt—and we suppose that the bitterest critic of railroad companies will admit that these are legitimate expenses which the traffic should be made to pay.

We will take, for example, the most northerly of the great routes between Chicago and New York, that composed of the Michigan Central, the Great Western of Canada and the New York Central & Hudson River—a line 960 miles long, which carries a large proportion of the traffic between the termini named, and a still larger proportion of that between the West and New England. The dividends made by these three companies for the last year for which reports from them all are accessible amounted to \$9,748,743, their gross earnings for the same year having been \$31,345,940. If the rates had been fixed so low as to produce only the latter sum minus the dividend, the proportion of the reduction would have been 31.1 per cent.

If we take the Lake Shore & Michigan Southern with the New York Central & Hudson River, we find that the entire non-payment of dividends would have permitted an average reduction of 27½ per cent. in the tariffs; or if we take this road with the Erie, as more properly the central of the three great routes, we will find that the gross amount of earnings by this route were \$31,965,980, and the dividends, \$3,173,148; and the non-payment of dividends would have permitted a reduction of a little less than 10 per cent. in the rates. The southern or Pennsylvania route, composed of the Pittsburgh, Fort Wayne & Chicago, the Pennsylvania Railroad, and the New Jersey railroads, earned \$34,677,490, and their dividends were \$6,943,630. The application of the dividend payments to a reduction of rates would have permitted a decrease of just 20 per cent.

But the fairest and most satisfactory conclusions will be reached by taking the aggregate of the earnings and dividends of the three great lines, which carry most of the freight between Chicago and the East, are almost the only dividend-paying roads which carry this traffic, and usually fix the rates for the rail traffic on the other lines. The following table gives the gross earnings and dividends for one year of each line, and the aggregate of all the lines forming the three great lines between New York and Chicago:

	Gross earnings.	Dividends.
New York Central & Hudson River.....	\$31,972,105	\$7,253,742
Erie.....	17,108,000	298,792
Pennsylvania (including leased New Jersey roads).....	26,283,516	5,594,195
Great Western.....	4,395,765	1,134,251
Michigan Central.....	4,978,070	1,350,750
Lake Shore & Michigan Southern.....	14,797,975	2,874,366
Pittsburgh, Fort Wayne & Chicago.....	8,393,974	1,419,505
Total.....	\$97,999,410	\$19,865,521

The dividends earned by the three great lines, therefore, were 20½ per cent. of the gross earnings, and so if the stockholder's income had been applied wholly to the reduction of rates, these would have been lessened by one-fifth, and the bushel of corn would be moved from Chicago this winter for 20 cents a bushel, instead of 36.4, as at present, provided the reduction should be made on coarse through freight to the same extent as on local and other classes of freight.

This, however, is what would hardly be possible. We all know that the through freight affords a smaller proportion of profit than any other kind of traffic. Its great amount affords large aggregate profits from a small percentage over expenses. Twenty per cent. reduction, in the present condition of railroad business, on through grain, would doubtless make the carrying of that staple altogether unprofitable—and certainly the companies cannot be expected to carry at a loss: at least they will not do so, whether they are expected to or not. We have no figures to show definitely what the cost of grain transportation is, but we believe we shall not be far out of the way if we say it is as much as 90 per cent. of the average.

Thus, granting that the railroad companies should give the use of their property free of charge, the current charges on wheat might be reduced from 39 to 35 cents, and on corn from 36.4 to 32½ cents a bushel.

This saving of about four cents a bushel on wheat and 3½ cents on corn might have been made by the entire cessation of the payment of dividends. If the shareholders should be permitted to receive one-half of their present dividends, the reductions could be only one-half as great, of course, and we believe no one would grudge them that amount of profit.

But, having saved four cents a bushel by the sacrifice of the dividends, or two cents, by the sacrifice of half of them on that small fraction (not more than one-sixth of the entire exports) of the grain carried east by rail, the question remains, Who will profit by the saving? Those who complain of high rates are the farmers.

Consumers do not complain of prices; the supply exceeds their demand, and any reduction in the cost of transportation will increase the supply, especially of corn, of which a less proportion than of wheat is exported. We may readily believe, then, that in the present condition of things the larger part—probably much the largest part—of any saving in transportation would go to the consumer.

We conclude, therefore, and we believe our conclusions have been pretty thoroughly demonstrated, that such a reduction of rates as would leave no profits for dividends would increase the average price of grain in Chicago by less than two cents a bushel.

The truth is, the stockholders' profits form comparatively a small part of the tax on traffic, however large their profits may be in some cases. Not that a small saving is not important, but that any saving made by a reduction in dividends would give no considerable relief to the producers of bulky staples distant from the consumers. It is the *actual cost* of transportation that needs to be reduced in order to give the needed relief—much needed relief, undoubtedly, at this time—and nothing else can give it to any considerable extent.

Such a reduction is doubtless practicable, and will be made. Indeed, to a considerable extent it has been made already; for, taking a series of years, the rates on the great lines show a progressive reduction in the receipts per mile per passenger and ton of freight. The most indispensable element in any large reduction is a very large increase of traffic on through lines, with the improvement of such lines to accommodate such traffic. There is now not one double-track line completed from Chicago eastward. Already the traffic is so great as to demand such track for its most economical handling, and the three great lines very soon will have double tracks completed throughout their length, two of them being nearly finished already. But so long as passenger and freight traffic is conducted on the same tracks, there must still be comparatively a great waste. There is not now, however, traffic enough for separate freight tracks, and this economy must be postponed until the traffic is still further increased. But this increase, we believe, is sure to come, and these improvements are sure to be made, and in them and other improvements in the methods of transportation must we look for that large reduction in the price of transportation which is of so great importance to the future prosperity of the Great West?

Railroad Earnings for December and the Year 1872.

We are able to present at this time the December earnings of but nineteen railroads, the Atlantic & Pacific and Pacific of Missouri, whose reports have been published heretofore, being very much behind. One of these has large and one very small earnings per mile, but both have heretofore shown a decrease in earnings per mile, so that their absence somewhat affects the aggregate.

These nineteen roads, with an increase in mileage of 7.16 per cent., show an increase in receipts of 10 $\frac{1}{2}$ per cent., and the increase in earnings per mile is 3 $\frac{1}{2}$ per cent.

For the year we have the report of eighteen companies, including all of the above except the Indianapolis, Bloomington & Western and the Ohio & Mississippi, and also the Central of New Jersey, which does not report monthly.

These eighteen companies, it will be seen, with an aggregate increase of 7 $\frac{1}{2}$ per cent. in mileage, show an increase of 12.5-16 per cent. in gross earnings, and the average increase in earnings per mile is \$430, or 4 $\frac{1}{2}$ per cent. The earnings per mile for the year are doubtless much above the average for the whole country, being \$10,081, which is a very satisfactory sum, and will probably admit of net earnings of something like \$3,500 per mile of road, which for lines with a moderate capital account is a reasonable profit.

Five of the eighteen roads reporting have more than the average earnings per mile. Two of these have very nearly the average rate, and of the others the Erie is nearly 90 per cent., the Lake Shore & Michigan Southern 60 per cent., and the Central of New Jersey 164 per cent. above the average. The increase in earnings per mile is more than 10 per cent. on one half of the lines; but all but two of these (the Central Pacific and the Lake Shore & Michigan Southern) are still below the average in their earnings per mile. Very large increases on heretofore large earnings have been made, however, by the Michigan Central (16 $\frac{1}{2}$ per cent.), and the St. Louis & Iron Mountain (24 $\frac{1}{2}$ per cent.), and the latter leads the entire list in its rate of increase per mile.

It is encouraging to observe that nearly all the roads with comparatively small earnings not only show an increase but a rapid rate of increase, only one with earnings less than \$7,000 per mile showing a decrease, and all the rest an increase of more than 10 per cent.

It is, however, hardly safe to make general deductions

RAILROAD EARNINGS, DECEMBER, 1872.

NAME OF ROAD.	Mileage.		Increase.		Earnings.		Increase.	Decrease.	Per cent.	Earnings per Mile	
	1872.	1871.	Miles.	P. c.	1872.	1871.				1872.	1871.
Atlantic & Great Western.....	539	506	33	6 $\frac{1}{2}$	\$403,950	\$357,103	\$46,847	.....	13%	\$749	\$705
Burl., Cedar Rapids & Minnesota.....	309	261	48	18 $\frac{1}{2}$	84,622	62,650	31,972	.....	35	274	240
Central Pacific.....	1,166	1,013	153	15 $\frac{1}{2}$	1,007,126	672,359	334,766	.....	49%	894	664
Chicago & Alton.....	650	600	50	8 $\frac{1}{2}$	361,171	377,687	.....	16,516	4%	556	629
Cleve., Col., Cin. & Indianapolis.....	470	390	81	20	337,464	329,926	7,478	.....	2 $\frac{1}{2}$	719	846
Erie.....	971	956	15	1 $\frac{1}{2}$	1,326,215	1,416,217	.....	21,902	1%	1,434	1,481
Illinois Central.....	1,109	1,109	.....	.....	640,183	688,181	.....	47,948	7	577	620
Indianapolis, Bloom'g & West'n.....	212	212	.....	.....	126,124	94,831	31,293	.....	34	595	447
Kansas Pacific.....	673	672	.....	.....	223,241	210,197	13,044	.....	6 $\frac{1}{2}$	332	313
Lake Shore & Michigan Southern.....	1,096	1,038	58	5 $\frac{1}{2}$	1,430,931	1,235,285	198,646	.....	16%	1,400	1,190
Milwaukee & St. Paul.....	1,121	1,018	103	16 $\frac{1}{2}$	513,789	473,295	40,492	.....	8 $\frac{1}{2}$	458	465
Marietta & Cincinnati.....	281	224	.....	.....	204,196	169,820	34,376	.....	204	719	598
Michigan Central.....	715	715	.....	.....	576,783	507,050	69,723	.....	13%	807	709
Missouri, Kansas & Texas.....	640	476	161	34 $\frac{1}{2}$	200,228	105,244	94,484	.....	90	213	221
Ohio & Mississippi.....	393	393	.....	.....	244,150	266,751	27,899	.....	104	749	679
St. Louis, Alton & Terre Haute.....	266	266	.....	.....	102,613	105,479	3,866	.....	2,866	326	307
St. Louis & Iron Mountain.....	285	234	61	27 $\frac{1}{2}$	295,970	169,605	56,365	.....	33%	793	757
Toledo, Peoria & Warsaw.....	237	227	10	4 $\frac{1}{2}$	90,886	99,804	.....	8,948	9	883	440
Toledo, Wabash & Western.....	628	628	.....	.....	492,635	516,934	.....	24,299	4 $\frac{1}{2}$	754	823
Total.....	11,763	10,988	775	7 $\frac{1}{2}$	\$8,711,084	\$7,858,368	\$976,895	\$124,179	.....	\$741	\$715
Total increase.....	.....	.....	.....	.....	.....	.....	852,716	.....	10%	.....	.....

RAILROAD EARNINGS, YEAR 1872.

NAME OF ROAD.	Mileage.		Increase.		Earnings.		Increase.	Decrease.	Per cent.	Earnings per Mile.			
	1872.	1871.	Miles.	P. c.	1872.	1871.				1872.	1871.	Inc.	Dec.
Atlantic & Great Western.....	539	506	33	6 $\frac{1}{2}$	\$5,130,962	\$4,485,789	\$645,173	.....	14%	\$9,557	\$8,869	\$684	7 $\frac{1}{2}$
Burlington, Cedar Rap'g & Minn.	265	168	97	58	993,685	571,010	424,675	.....	74%	3,757	3,399	358	10 $\frac{1}{2}$
Central, of New Jersey.....	272	272	.....	.....	7,213,1.0	6,841,379	371,730	.....	5 $\frac{1}{2}$	26,519	25,152	1,367	5 $\frac{1}{2}$
Central Pacific.....	1,166	999	167	16 $\frac{1}{2}$	12,900,196	9,467,079	3,433,054	.....	86 $\frac{1}{2}$	11,064	9,477	1,587	10 $\frac{1}{2}$
Chicago & Alton.....	625	536	99	19	5,191,256	5,267,097	.....	.....	1 $\frac{1}{2}$	8,306	10,013	.....	\$1,707
Cleveland, Col., Cin. & Indianap.	430	390	40	10 $\frac{1}{2}$	4,429,209	3,866,076	563,133	.....	14%	10,300	9,913	387	8 $\frac{1}{2}$
Erie.....	971	956	15	1 $\frac{1}{2}$	18,36,49	17,397,334	948,715	.....	5 $\frac{1}{2}$	18,894	18,198	696	2 $\frac{1}{2}$
Illinois Central.....	1,109	1,018	13	10 $\frac{1}{2}$	7,922,644	8,401,144	.....	478,500	584	7,144	7,757	.....	431
Kansas Pacific.....	672	672	.....	.....	3,644,1.2	3,309,626	337,356	.....	10 $\frac{1}{2}$	8,428	9,926	457	10 $\frac{1}{2}$
Lake Shore & Mich. Southern.....	1,096	1,038	58	5 $\frac{1}{2}$	17,537,734	14,979,975	2,557,759	.....	17 $\frac{1}{2}$	16,002	14,433	1,570	10 $\frac{1}{2}$
Michigan Central.....	713	715	.....	.....	6,994,121	5,984,907	1,009,917	.....	16 $\frac{1}{2}$	9,782	8,871	1,411	16 $\frac{1}{2}$
Milwaukee & St. Paul.....	1,121	1,018	13	10 $\frac{1}{2}$	6,937,771	6,690,691	367,077	.....	4	6,907	6,572	363	5 $\frac{1}{2}$
Marietta & Cincinnati.....	284	284	.....	.....	2,029,927	1,690,714	339,913	.....	20%	7,148	5,953	1,195	20 $\frac{1}{2}$
Missouri, Kansas & Texas.....	316	399	13	34 $\frac{1}{2}$	1,887,462	937,293	934,169	.....	89 $\frac{1}{2}$	3,581	2,499	1,022	41
St. Louis, Alton & Terre Haute.....	266	266	.....	.....	1,888,922	1,837,665	51,287	.....	2 $\frac{1}{2}$	7,101	6,909	192	2 $\frac{1}{2}$
St. Louis & Iron Mountain.....	237	213	23	11	9,271,558	1,645,766	625,799	.....	38	9,625	7,737	1,898	24 $\frac{1}{2}$
Toledo, Peoria & Warsaw.....	237	227	10	4 $\frac{1}{2}$	1,072,948	1,270,216	197,368	.....	18 $\frac{1}{2}$	5,360	4,727	633	13 $\frac{1}{2}$
Toledo, Wabash & Western.....	624	628	.....	.....	5,736,682	231,655	4	9,504	9,133	369	4	.....	4 $\frac{1}{2}$
Total.....	11,168	10,886	782	7 $\frac{1}{2}$	\$112,579,233	\$100,940,351	\$12,638,934	\$554,341	.....	\$10,081	\$9,611	\$430	.....
Total increase.....	.....	.....	.....	.....	.....	.....	12,638,932	.....	18 $\frac{1}{2}$	.....	.....	.....	.....

from these reports, as they cover less than one-sixth of the mileage of the country.

TESTING MATERIALS USED ON RAILROADS.

Probably if the master mechanics of most of our railroads were to make requisitions for testing machines, to determine the strength and quality of iron and other materials used, in at least nine cases out of ten their superiors would regard such a demand as unnecessary extravagance. It is probable, nevertheless, that such an investment of money instead of being useless would in many cases result in very great economy. It is certainly very important to companies whose expenditures for materials are counted by millions to know definitely what they are getting for their money, which it is often impossible to know without carefully testing that which is bought.

A 2-inch iron bar which will resist a strain of 40,000 lbs. is worth much more than one which breaks at half that weight. It is desirable, therefore, that an engineer, master mechanic or car-builder should be able, when he buys iron, to determine certainly and promptly what its strength is. If iron were bought with the understanding that it must be of a certain definite strength, and be tested in a specified way, it is quite certain that a very much better quality would be furnished than if no such tests were made. The same is true of other material, such as boiler-plate, cast iron, rope, etc. The amount of knowledge, too, which a master mechanic would acquire by having at hand a ready means of making such tests would be of immense service to him and to his employers in contracting for material, and also in designing machinery and other structures. Without such facilities, he is obliged to depend upon materials of whose strength he is ignorant. It is impossible, for example, to know the strength of chain from a mere inspection without experiment, and yet if applied to the trucks of cars the lives and safety of the passengers at some time may be entirely dependent upon its quality and strength. In designing machinery much valuable knowledge would thus be gained by careful tests of the material employed. It does not require much experience to learn that a purchaser who is ignorant of the qualities of the goods he buys is nearly always at the mercy of the seller. There is nothing which conveys so much information of the qualities of metals as careful experiments concerning their strength, and the tricks of trades which have been revealed by good testing machines would surprise many novices. The accidents which are almost daily causing sorrow and suffering, or exciting indignation or apprehension, all warn us of the importance of more careful inspection of materials and machinery. If railroad managers knew more definitely

the nature of the material of which their rails, wheels and axles are made, the list of accidents which we publish monthly would be materially reduced. At the present time it seems to be regarded as sufficient reason and excuse for an accident that it is found to be attributable to a broken rail or wheel. Quite the reverse should be the case, and disaster from such a cause should be regarded as conclusive evidence of culpability on the part of the railroad company.

It is not alone, however, in the strength and power of resistance of materials that testing machines are useful. They serve quite as good a purpose in revealing the mistakes and defects of design and construction as they do in determining the quality of materials. We took occasion only a short time ago to call attention to the proportions of the fastenings of car check chains. The same faults are common in boiler stays and many other parts of railroad machinery, the defects of which would be at once revealed by a few experiments. At the present time, notwithstanding all the discussion of the subject, nothing is known very definitely or accurately about the relative strength of boiler plates which are drilled and those which are punched, chiefly because those who are interested in the subject have no facilities for making the experiments, and those who have the facilities feel no interest. Consequently we go on making boilers without knowing what their strength is, excepting that they are often too weak and blow up, with certain very sad and disastrous

little attention is given to their inspection. The qualities of all kinds of lubricants, oils and paints can also be determined by experiment, and a more rigid inspection would undoubtedly secure the purchaser a better quality.

There has also been considerable attention called quite recently to the quality of water used for locomotives. That the analysis of such water will receive much more attention hereafter than it has heretofore, we think there can be no doubt. Before water is used for locomotives, it should be analyzed both chemically and microscopically, and that immense economy would result from the exercise of more care in this direction, an inspection of the inside of locomotive boilers on almost any Western railroad will at once show. The waste of fuel and the destruction of boilers due to incrustations are now enormous, much of which could be entirely prevented by the exercise of greater care in selecting water.

It has been suggested that the Master Mechanics' Association might establish, with much advantage to their employers, a sort of laboratory, with all the most improved appliances for testing materials, etc., and place it in charge of a competent expert, who would report upon the samples submitted and make a charge sufficient to render the place self-sustaining. Such an establishment might be of immense service to railroad companies, if conducted with the right kind of ability. The person or persons in charge would, however, need to have not only high scientific attainments, but unflinching integrity, as they would be subjected to the influence of all kinds of "motives," which, if allowed to prevail, would not promote scientific impartiality.

There are indications now that many railroads to be profitable to their owners hereafter must be managed in the most economical manner possible, and that the greatest skill must be exercised to secure economy. It is to be regretted that so few managers appreciate the value of skill and knowledge in the management of a business so extensive and so intricate, and involving so many scientific questions as the operation of railroads does. A merchant doing a business of a few millions will pay a very liberal salary to a competent person to make his purchases, whereas a railroad company whose operating expenses are from two to five times as great, will make the salaries of the persons who direct such expenditures, as compared with those paid by private establishments, in an inverse proportion to the amounts involved.

To expend several millions or even several hundreds of thousands of dollars per year for a great variety of materials, machinery and labor, and to get in return full value for the expenditure, require much more than ordinary skill, and nothing would aid so much in securing full value for the money as a vigorous system of tests applied in an intelligent way. The capacity, however, of making strictly accurate and impartial tests, and reporting them in a clear and concise manner, as the world goes and as men are educated, is comparatively rare. Notwithstanding this, however, it would we believe be very profitable to large railroad companies to adopt a vigorous system of testing all the material bought. Let it be known when contracts are made that the material bought is subject to inspection, and will not be accepted unless it stands the tests, and there is little doubt that much which dealers and manufacturers now "shove on to" railroad companies would be shipped to other destinations.

Record of New Railroad Construction.

This number of the RAILROAD GAZETTE has information of the laying of new track, as follows:

Portland & Ogdensburg—Vermont Division.—Extended from Morristown northwestward 4 miles to Hyde Park, Vt., 50 miles northeast of St. Johnsbury. *Utica & Black River.*—Extended from a point three miles north of Carthage northwestward 12 miles to Philadelphia, N.Y., about 12 miles. *Syracuse & Chenango Valley.*—Extended from Erieville southeastward 14 miles to Earville, N.Y. *Central Valley.*—This road (of 3-foot gauge) is completed from Bainbridge, N.Y., on the Albany & Susquehanna Railroad, north 12 miles to Smithville Flats.

This is a total of 42 miles of new railroad.

The absence of this record in the two preceding numbers of this journal was occasioned rather by a want of material rather than otherwise. We here summarize the extensions chronicled.

The following were in the number of January 18:

Portland & Ogdensburg—Vermont Division.—Extended from Wolcott northwestward 5 miles to Morristown, Vt. *Dakota Southern.*—Extended from Vermillion westward 20 miles to James River.—This is a total of 25 miles of new railroad.

The number for January 25 gave the following:

Houston & Texas Central.—Extended from McKinney northwestward 17 miles to Van Alstyne. *Montpelier & Wells River.*—Extended for 3 miles from Montpelier. *Rio Grande.*—Extended 14 miles to a point 20 miles west of Point Isabel, Texas. *International.*—Extended from Overton northeastward 14 miles to Kilgore, Texas.

This is a total of 48 miles of new railroad.

Of the entire amount chronicled last month, not more than 70 miles has been completed since the first of January.

The Vienna Exhibition.

The following bit of discussion in the Senate is copied by reason of the very neat reply made by Mr. Schurz in the debate in the Senate on the bill to enable the United States to participate in the Vienna Exhibition. It is a most concise and complete refutation of the reasons which have been so persistently urged by a contemporary to defeat the appropriation:

"Mr. Chandler opposed the amendment, and said he was opposed to making any appropriation for this purpose, because experience had shown American inventors that the main result of taking part in such expositions was to have their inventions appropriated by foreigners."

"Mr. Schurz replied that, in the first place, if foreigners wished to steal our inventions they could do so at any time by copying the models in the Patent Office; in the second place, those inventors who feared to take the risk might keep their inventions at home; and, in the third place, the Austrian Government had issued a decree designed to protect the rights of foreign inventors."

By the way, this increase in the appropriation was voted in the Senate, but cut down to \$200,000 in the House, which, if not so good as \$300,000, is at least twice as good as \$100,000.

THE HEATING OF CARS is the subject of the following positive assertions in one of the New York papers (*the Times*), which would have us believe that the only obstacle to the introduction of its simple, safe and comfortable heating apparatus is the total depravity of railroad companies and their servants. This is his treatise on heating:

"It seems that there actually are persons who believe that railway cars cannot be heated by steam from the boiler without danger of scalding the passengers. This is an excuse put forward by the railway companies, and its falsity is shown by the fact that though our ferry-boats are heated by steam from the boiler, the steam-pipes are rarely hot enough to burn the hand that may be laid upon them. The exhausted steam of the locomotive could be used for heating purposes with perfect safety, and the only objection to it is that it would require a few moments of time to connect the pipes running through the cars with the escape pipe. The railway brakeman is jealous of his time, and we could point to a railway in the neighborhood of this city, where the steam-brakes with which the cars are provided are frequently neglected because it would occupy five minutes to place them in working order. When the brakeman is willing to keep steam-pipes in order, our trains can be heated with them, and all danger of fire avoided."

The author of these very positive, and, we might add, very stupid, assertions had even the most superficial knowledge of the construction or operation of locomotives, or even had taken the trouble to enquire of those who knew, he would have learned that the exhaust steam is needed to create the necessary draft which is required for the very rapid combustion in locomotive boilers, and, therefore, could not be used for heating cars. If it was, the fire would not be stimulated sufficiently to make steam for the engine. The reason which prevents the use of "live steam," drawn directly from the boiler, is that there is none—especially in cold weather—to spare. The most difficult problem in locomotive construction is to provide boiler capacity enough for the engines alone. The largest locomotive boilers have not enough for the economical generation of steam for moving the train, and all such boilers would (or should) be made larger, if we could find a way to do it without increasing the weight of engines, already so destructive to the track. If the writer in the *Times* who undertakes to instruct railroad managers would oblige them by indicating not only how brakemen but how boilers of greater capacity can be furnished, doubtless he would find that considerably more knowledge of the subject is needed than he supposed.

AN AUTOMATIC BELL is proposed by "Hindoo" as a substitute for the steam whistle for giving warning at crossings, etc. If "Hindoo" or any one else will design such a bell, filling all the requirements, he will find it in great demand. But a simple connection with the engine will not do. The bell should begin ringing a few moments before the wheels begin turning, and yet should be so continued that the locomotive cannot be started unless the bell is ringing. Then it should not ring very slowly at first and afterwards with fearful rapidity. Distinct and decided warning is needed when the engine starts, and one stroke of the clapper to one revolution would be inadequate at first, while at full speed it would be an unearthly clatter, perhaps quite as much a nuisance as the ear-piercing, rest-disturbing whistle. If the movement of the throttle valve sets the bell in motion, then it is likely to ring too slow at first and too fast afterwards, besides not ringing at all just before starting; if on the other hand the bell is rung by a separate engine and set in motion by a separate action of the engineman, then there is no security (greater than exists with the bell rung by hand) that the bell will always be rung at crossings and elsewhere where safety or the law require. Every now and then claims are made for stock killed at crossings, etc., where the validity of the claim depends upon evidence of negligence in ringing; and when the claimants swear that they didn't hear the bell, juries sometimes believe them, though engineman and fireman swear they rung it. If it was impossible to move the train without ringing, the proper warnings would certainly be made, and false claims based on asserted negligence in ringing could not be maintained, and negligence in ringing would of course be impossible.

NEW PUBLICATIONS.

Official Guide of the Chicago & Alton Railroad.—Mr. James Charlton, the General Passenger and Ticket Agent of the Chicago & Alton Railroad, who is a man of fine literary taste and culture, as well as a very capable railroad officer, has hit upon something new in the way of a railroad guide for his road. The object of such guides usually is to advertise the road,

and to this end it is not enough that it be published and distributed; it must be preserved by the recipient, so that it may have its proper effect at the proper moment—that is, when he is choosing his route for a journey. Now the average timetable, though printed in all the colors of the rainbow, has too few attractions to induce the average man to keep it, and a book made up of time-tables will hardly last any one more than one trip, especially if it can be had for the asking. The problem then is, to add to the guide proper something of general interest or value, which will cause the book to be preserved.

Mr. Charlton's method of solving this problem is to stitch with the guide proper a sheet containing a reprint from some author of note, and he begins with Robert Browning, giving a sheet of 16 pages which contains "Pauline," a work of the author's youth, intense in expression, and one page of "Paracelsus." Announcement is made that the publication of this poet's works will be continued in subsequent numbers of the guide, until they are completed. And it must not be supposed that the publication is piecemeal, on alternate pages, or in any shabby manner. On the contrary, it is a beautiful piece of typography, and the paper is of fine quality. The sheets of the different numbers are to be paged consecutively, so that they may be separated from the rest of the pamphlet and bound in one handsome volume when a work is completed. A little more margin is needed if the sheets are to be bound, but otherwise hardly any fault can be found with the appearance of the publication.

As to its value to the company, that is another question. We fear that the accounts of sales of Browning's Works by his American publishers, or an investigation of the calls made for them at public libraries, would indicate unmistakably that those who read them are eminent for culture rather than numbers; and if the Chicago & Alton Company should offer to bind gratis all the copies which have been preserved for the sake of the poems, we fear that the expense would be shockingly small. But, of course, the idea of the publication and the selection of the literature are two different things; and though Browning's poems might tempt very few to preserve the guides, doubtless something else would.

And this suggests that, perhaps, through this method of advertising railroad companies may become customers for literary wares. Of course, the chances for the preservation of the Guide are increased, if its literary contents are not only attractive and popular, but are to be found nowhere else. Imagine Mr. Charlton to have secured one of Bret Harte's best stories—"Miggles," the "Idyl of Red Gulch," or whatever it might be—put it in one of these Guides and permitted its publication nowhere else. That Guide, we imagine, would be preserved in many homes, and the chief drawback to its efficiency would really be the enormous demand for it, which might make it cost more than it came to.

Another attraction, and not a very costly one, which might be utilized, may be found in really good engravings. Pictures of living interest and well designed, engraved and printed are very likely to be preserved.

All this is on the supposition that a guide is not, and cannot be made, sufficient in itself, but needs something added to it to make it worth keeping. We have something in mind to say of guides as guides, but must put off saying it till a more convenient season.

The American Railway and Supply Directory, for 1873, which was to be issued about this time, has been so delayed by the destruction of its type and material in the great Boston fire that it will not be issued until the 1st of March. The publishers, Messrs. Greenough, Jones & Co., ask their patrons to be patient, as their misfortune has made the delay unavoidable.

Report of the Illinois Railroad Commissioners.

One very large part of the late annual report of the Illinois Railroad and Warehouse Commissioners (dated December 1, 1872) is taken up with history of the litigation by which the enforcement of the provisions of the law regulating freight and passenger tariffs has been sought, and in recounting defects in these laws, and another large part in the report on warehouses. An abstract of the report will probably be quite as acceptable as the document in full.

The failure of the existing law to designate methods of prosecution and fix penalties (since the violations of the law are not misdemeanors by the common law) is assigned as an obstacle which has made it difficult or impossible for the Commissioners to take effective measures for the enforcement of such of the laws as the railroad companies do not recognize.

The history of the case of the State against the Chicago & Alton Railroad Company for discrimination in freight rates, which resulted in the Circuit in a decision against the company and is now before the Supreme Court of the State for decision, is recited.

The importance of authority to employ professional aid in the prosecution of cases against railroad companies is enlarged upon. There is now no provision for the compensation of counsel in such cases. The Commissioners recommend the passage of a law providing for the temporary working of railroads whose charters may be forfeited by receivers to be appointed by the courts pronouncing judgment of forfeiture, and one for the reorganization of such companies.

The Commissioners have advised with individuals concerning bringing suits for violation of the passenger fare law; have notified companies of neglect to comply with the law concerning sign-boards at crossings (which neglect has been almost always remedied after notice); have received and reported on complaints of the underbilling of grain in cars; have received no complaints of violations of the law requiring the provision of track scales at stations (the lack of which gives opportunity for underbilling); brought suit against warehousemen of "Class A" for neglecting to take out licenses, which suit was gained in the lower court and is pending in the Su-

preme Court; brought suit against warehousemen for charging more than the legal rate for storage, in which suit the Circuit Court decided that there was no public remedy for overcharging, the law having fixed no penalty.

The two bills consolidating and digesting all laws relating to railroads and warehouses, with alterations deemed essential, which were prepared by the Chairman of the Board and presented to the Legislature, but not passed, a year ago, are again recommended.

Objection is made to a bill providing inflexible rates for freight, and the following is quoted from last report:

"As far as freight tariffs are concerned, it is laid down by competent authorities that to fix general tariffs inflexible for a period of years, which must be the case if they are fixed by the Legislature with no provision for modification except by legislative action, seems to be wholly impracticable. Where it has been attempted, it has always failed, never being properly complied with. What is reasonable for one road is not for another, and would destroy the latter. What might be reasonable in one season might be very burdensome at another. Peace or war, famine or plenty, the state of the domestic or foreign markets, would exercise vast influence upon the proper adjustments of such tariffs."

The rates, they think, might be adjusted from time to time "by such persons as the Legislature shall see fit to confide in, and it may be controlled, if deemed expedient, within limits and exercised in methods to be established by law."

An appropriation of \$20,000 is asked for additional counsel in cases brought against railroad companies and warehousemen.

The fees fixed for grain inspection are given, and a report of the amount inspected during the first year of the Commission's charge of this matter. An account of sundry warehouse frauds is given, especially of that of Muun & Scott, who placed false bottoms in their bins and then invited measurement of the stock in their warehouses.

Complaint is made of omissions made by railroad companies in filling up the blank forms of reports furnished by the Commission, which often had to be returned several times before they were properly filled. It is said, however, that these omissions and imperfections were owing in most cases to the fact that the companies had not theretofore kept a record of the matters called for, and to the other fact that the fiscal years of most of them were not coincident with the year for which reports are required by the Commission, which latter ends with June.

The following interesting paragraphs we copy from the report, they forming its close:

"The construction of railroads during the past year has been characterized by a vigor and activity similar to that which accomplished so much the preceding year. Since the last report of the railroad companies, 1,709.68 miles of railroads have been brought into use, giving a grand total of 6,258.80 miles in actual operation on the 1st day of July, 1872, and 1,587.30 in process of construction.

"The average cost of the completed and classified railroads in the State, as exhibited by the reports of the various railroad companies, the mileage being 5,331.41 miles, is about \$42,264.48 per mile, making the aggregate represented cost of those roads \$225,329,271.31.

"The fact that our roads show such great cost cannot, as a rule, be traced to natural obstacles and difficulties of construction presented by the materials encountered, or by the contour of the surface of the State. On the contrary, the topography of the country is especially adapted to the building of railroads at a moderate cost. It may be safely assumed that, during the past 20 years, the average cash cost of constructing the railroads of the State, including their equipments, has not exceeded \$25,000 per mile. The difference between this and the cost they represent has arisen in various ways, such as fictitious stock, sacrifices made in sale of securities, and other losses growing out of bad management, and unavoidable delays in the work of construction.

"However it may have occurred, it is nevertheless true; and the managers of railroads are expected by the holders of the securities and stock to obtain net earnings sufficient to pay the interest on the bonded debt, and also dividends on all classes of stock, in addition to improving and adding to the capacity of the lines as rapidly as the growth of the country tributary to them demands.

"This unfortunate excess in the cost of the roads of the State, as shown, should at least excite earnest and effective action to prevent any increase to the burdens of the public of a similar nature, done in other methods (especially if there is no retrospective relief).

"It may be that a law to protect the public welfare, prohibiting any road from accumulating or representing greater than a given value per mile, except under specified conditions, would meet the possibility of fiction creeping in under other forms, fictitious in all but the tithes demanded from the people. We called attention to these evils in our first annual report, and the importance of the subject seems to justify its renewed mention.

"The total capital stock of the railroad companies of the State properly chargeable to, embraced and represented by their lines and property within the limits of the State:

Preferred stock.....	\$8,155,199 68
Common stock.....	131,970,864 40
Bonded debt.....	111,456,325 97
Floating debt.....	3,330,173 20

Total capital represented..... \$34,912,563 45

"The gross earnings of the completed and classified railroads are as follows:

From freight.....	\$30,074,594 42
From passengers.....	10,135,164 06
From mails, express and miscellaneous.....	2,937,669 57

Total..... \$43,237,428 04

"The average proportion of the expenses for maintenance and operating, to be deducted from gross earnings, is 65.60 per cent.

"The average gross earnings per mile per annum were \$8,108.06.

"The average net earnings per mile were \$2,789.18.

"With a view of presenting in a comprehensive and also detailed form the railroad facilities of the State, with reference to the agricultural and general interests, the Commissioners caused a table to be prepared, exhibiting the amount of land in each county of the State lying within 5 miles of a railroad; also the amount lying between five and 10 miles, between 10 and 15 miles, and between 15 and 20 miles and over. This interesting table shows, with sufficient accuracy for the purpose intended, that 78 per cent. of all the land in the State lies within 5 miles of the railroads in actual operation; 21 per cent. between 5 and 10 miles; 4 per cent. between 10 and 15 miles, and 1 per cent. between 15 and 20 miles and over.

"To such advantages add those which are presented by the lake, navigable rivers, canals and slack-water navigation of the State (also the railroads adjoining its border, not included in

the estimate), and it may be fairly presumed that no other State in the Union possesses equal facilities for the transportation of persons and property so uniformly distributed through its territory."

An additional report is made relating the history of the case against the Illinois Central Company for violation of the law limiting passenger rates, the decision of which, denying the validity of the law, was made a few days after the main report was presented. Messrs. Koerner and Hammond reargue the case briefly, and claim that the Legislature may properly exercise the judicial function of deciding whether rates are extortionate, because the Constitution of the State specially assigns it that function. Mr. R. P. Morgan, Jr., the third Commissioner, does not sign this additional report, and assigns his reasons therefor, which are that the Commission was not engaged in the case, which was a prosecution by an individual; that he believes the history of the case in that additional report to be incomplete and imperfect; that he considers it out of place for the Commission to review a judicial decision; that the case is one over which the Commission has no control; and, finally, that the decision was not made until after the close of the year to which the general report refers.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

The New York, New Haven & Hartford Company at its annual meeting at New Haven, January 15, elected the following board of directors for the ensuing year: William D. Bishop, William P. Burrall, Wilson G. Hunt, C. Vanderbilt, George N. Miller, Chester W. Chapin, Horace F. Clark, A. R. Van Ness, Henry C. Robinson, E. H. Trowbridge, E. C. Read, Nathaniel Wheeler and C. M. Pond. Messrs. Bishop, Hunt, Miller, Clark, Van Ness, Trowbridge and Wheeler are of the old New York & New Haven board, and the others are of the old Hartford & New Haven road. Messrs. William White, of New Haven, Charles Bowell, of West Hartford, and William M. Vermilyea were appointed a board of auditors for the ensuing year.

At the annual meeting of the Bald Eagle Valley Railroad Company at Lock Haven, Pa., January 13, 1873, the following officers were elected for the ensuing year: L. A. Mackey, President; Thomas A. Scott, Andrew G. Curtin, James Gamble, Wm. P. Wilson, Charles A. Mayer, Amos C. Noyes, Directors; H. T. Beardley, Secretary and Treasurer. The road is leased by the Pennsylvania Railroad Company.

The officers of the New York, Boston & Montreal Railroad Company, formed by the consolidation of the New York, Boston & Northern and the Harlem Extension Companies, are as follows: President, George H. Brown; Vice-President, John Q. Hoyt; Directors, George H. Brown, John Q. Hoyt, Andrew McKinney, Henry H. Van Dyck, Joseph Seligman, Grosvenor P. Lowery, William B. Ogden, Moses Y. Tilden, Christopher Meyer, William S. Eno, John S. Shultz, A. A. Selover, and G. W. Park; Treasurer, A. McKinney; Secretary, John S. Shultz; Engineer-in-Chief, Henry A. St. John; Consulting Engineer, General E. L. Viele; Solicitors, Porter, Lowery & Soren.

Mr. Alden B. Stockwell, President of the Pacific Mail Steamship Company, and for a year or two past one of the largest and counted one of the shrewdest operators in the New York Stock Exchange, has been chosen President of the Atlantic & Pacific Railroad Company in place of Andrew Pierce, Jr., resigned. It is understood that Mr. Stockwell, or he and his friends, has secured a controlling interest in this company's stock.

At a meeting of the stockholders of the Pelham & Port Chester Railroad Company (a branch of the New York, Westchester & Boston), held January 22, the following directors were chosen: John Van Nest, George J. Penfield, W. R. Bergholz, Alan Hay, C. D. Van Wagener, John R. Poore, J. F. Harrison, J. B. Hodgeson, C. A. Burgess, George W. Davids, John F. Daly, Frederick Schumacher, Alvan Higgins.

The following is the newly organized directors of the South Side Railroad Company of Long Island: John J. Shipherd (new), Charles Fox, J. Boorman Johnston, Jacob R. Shipherd (new), Daniel T. Willets, John D. Jones, William Floyd Jones, Elizur Hosford (new), H. C. Hepburn, Walter S. Carter (new), T. D. Tappan, Geo. Wm. Ballou (new), Charles H. Dewey (new). The following are the newly elected officers of the Company: President, John J. Shipherd; Vice-President, Elizur Hosford; Secretary, Charles L. Hopkins; Treasurer, Charles H. Dewey; General Manager, H. G. Smith; Superintendent, L. S. Canfield; Auditor, C. H. Dewey; Chief Engineer, J. C. Lane; Master Mechanic, Geo. H. Griggs; Purchasing Agent, Theo. Wells; Superintendent of Depots, L. C. Sleight.

A meeting of the directors of the Chicago, Decatur & St. Louis Railroad Company was held January 21, in the office of Snell, Taylor & Co., No. 446 Wabash avenue, Chicago. John F. Tracy was elected President, and H. H. Porter, Vice-President. Messrs. Weldon and McNulta, of Bloomington, were appointed the attorneys of the road. The following gentlemen compose the board of directors for the present year: Messrs. John F. Tracy, H. H. Porter and Abner Taylor, of Chicago; Lee A. Hall, of St. Louis; J. C. Prescott, of Indianapolis; J. J. Peidereoc and W. L. Hammer, of Decatur, and J. R. Means, of Saybrook. Mr. Tracy succeeds F. H. Winston as President and in the board, which seems to have been reduced in number from fourteen to eight.

The officers of the Grand Rapids, Newaygo & Lake Shore Railroad Company are as follows: President, D. P. Clay; Secretary, C. Warner; Treasurer, E. P. Fuller; Directors, D. P. Clay, W. D. Foster, E. P. Fuller and L. H. Randall, of Grand Rapids, Mich.; W. D. Fuller, A. Paddock and E. L. Gray, of Newaygo, Mich.; J. W. Converse, of Boston, and C. Warner, of Chicago.

The officers of the Mount Alto Railroad Company are: J. S. Waterman, President; W. J. Barr, Secretary and Treasurer; George B. Wiestling, Engineer and Superintendent. The Secretary's office is at No. 407 Walnut street, Philadelphia, and that of the Engineer and Superintendent is at Mount Alto, Pa.

Mr. William H. Gatzmer has been appointed Consulting Manager of the Lehigh Valley Railroad. Mr. Gatzmer was long connected with the Camden & Amboy Railroad, and was for several years President of that company. He is widely and favorably known both as an efficient railroad man and a citizen of high character and standing.

At a meeting of the directors elected by the consolidation of the Mississippi Valley & Western Railway Company, the Mississippi Valley Railroad Company and the Clarksville & Western Railroad Company, held at Canton, Mo., January 20, 1873, the articles of consolidation of the three companies were duly ratified, confirmed and signed by the respective presidents, and the name of the consolidated company was made the Mississippi Valley & Western Railway Company. The directors are: Hon. John B. Henderson, St. Louis; John O. Roberts, Clarksville, Mo.; Col. J. T. K. Hayward and C. O. Godfrey, Hannibal, Mo.; Henderson Davis, Nat Rollins and J. W. Whipple, Canton, Mo.; Col. E. Pratt Buell, Warsaw, Ill., and George

Edmunds, Jr., Sonora, Ill. The officers elected are: Col. J. T. K. Hayward, President; Col. E. Pratt Buell, Vice-President and General Manager; Henry Root, Treasurer; Nat Rollins, Secretary, and Hon. George Edmunds, Jr., Counsel. Finance Committee, Col. E. Pratt Buell, Hon. George Edmunds, Jr., and Col. J. T. K. Hayward. The officers appointed by the General Manager are as follows: J. W. Whipple, Assistant Superintendent and Assistant Engineer; W. F. Rector, Assistant Treasurer and Cashier; Chas. H. Spencer, General Freight and Ticket Agent; Nat Rollins, Attorney; A. R. Pippitt, Train Dispatcher; John S. Pickering, Master of Machinery, and John A. Hamilton, Road-Master.

At the annual meeting of the Lehigh Valley Railroad Company, January 21, Charles Hartshorne, William W. Longstreth, William H. Gatzmer, J. Gillingham Fell, William A. Ingham, Joseph Wharton and George B. Marke, of Philadelphia; David Thomas, of Catawissa, Pa.; William L. Conyngham, of Wilkes-Barre, Pa.; Ario Pardee, of Hazleton, Pa.; Asbel Welch, of Lamberton, N. J., and John Taylor Johnston, of New York, were chosen directors. Messrs. Wharton and Marke are new directors, replacing Messrs. E. H. Trotter and E. Roberts, of Philadelphia. Hon. Asa Packer was re-elected President, and Charles Hartshorne, Vice-President.

Hon. Ezra Cornell has been elected President of the Utica, Ithaca & Elmira Railroad Company, in place of General Burt, of Boston.

Mr. George F. Gage, formerly Superintendent of the Reading & Columbia Railroad, has been appointed Superintendent of the Huntingdon & Broad Top Railroad.

Mr. D. H. Winton, formerly Master of Transportation, has been appointed Assistant Superintendent of the Kansas City, St. Joseph & Council Bluffs Railroad.

At the annual meeting of the Colebrookdale Railroad Company, held at Philadelphia, January 20, the following officers were elected: President, Joseph S. Bailey; Directors, P. Breindlinger, R. B. Cabeen, John C. Smith, J. S. Bell, D. J. Brown and W. A. Church; Secretary, Howard Hancock; Treasurer, John Welch.

The Illinois & St. Louis Railroad & Coal Company has elected the following board of directors for the ensuing year: J. S. McCune, Adolphus Meier, Robert Campbell, James Clark, N. Schaffer, N. H. Brach, John A. Lackey, Joseph Ogle, Russell Hinckley, Martin Herr, Gustavus A. Koerner, Philip Schuck, Jefferson Rainey, S. B. Rentschler and B. F. Switzer.

Dauphin Buckminster, of Keene, N. H., has been appointed Railroad Commissioner of New Hampshire temporarily, to supply the place of C. P. Gage, of Nashua, who is sick. The appointment is good only until Mr. Gage shall be able to resume his duties.

The Baltimore, Catonsville & Ellicott City Railroad Company held its annual meeting in Baltimore, January 16, and choose the following board of directors for the ensuing year: Thos. Baumgardner, George K. Reid, John A. Sheaff, and John M. Barry, all of Lancaster, Pa.; Solomon King, of Baltimore; John C. Sullivan, of Catonsville, and Daniel J. McCaully, Mayor of Ellicott City. The new board then convened and elected the following officers: George K. Reid, President; John Glenn, Treasurer; William S. Shoemaker, Chief Engineer; and John M. Barry, General Superintendent.

The name of the new Assistant Superintendent of the St. Paul & Sioux City Railroad is T. B. Burnett, and not J. B. Bennett, as previously reported. His headquarters are at Sioux City, Iowa.

Mr. Allen McCoy has been appointed General Freight Agent of the International & Great Northern Railroad, in place of John Libson, resigned. His office is at Houston, Texas.

PERSONAL.

S. W. Dorsey, the recently elected Senator from Arkansas, is President of the Arkansas Central Railroad Company.

W. D. Ward has resigned his position as Chief Engineer of the Winona & St. Peter Railroad.

Mr. A. E. Touzalin, late General Passenger Agent of the Burlington & Missouri River Railroad, on leaving that road to accept his present position on the Atchison, Topeka & Santa Fe road, was presented by his friends with a very handsome watch and chain, the watch alone being valued at \$500.

Mr. Washington Butcher, for many years a director of the Pennsylvania Railroad Company, and for some time recently acting President of the American Steamship Company, died at his residence in Philadelphia, January 8.

Mr. Charles K. Pemberton, who has been an engineer on the Boston & Maine Railroad for 35 years and was the oldest engineer in New England, died at Great Falls, N. H., January 24, after a long and severe illness.

TRAFFIC AND EARNINGS.

The earnings of the Erie Railway for the week ending January 15 were: 1873, \$357,124; 1872, \$345,590; increase, \$11,534, or 3½ per cent.

The earnings of the St. Louis & Southeastern Railway (consolidated) for the second week in January were \$18,290. The ice blockade in the Ohio River still obstructs navigation.

The earnings of the Kansas Pacific Railway for the second week in January were: from passengers, \$13,270.85; freight, \$18,153.75; mails, \$2,055.31; total, \$33,479.92. Of this amount \$2,567.48 was for transportation of troops, mails and government freight.

The receipts of the Great Western Railway of Canada for the week ending January 3 were: 1872, £17,551; 1871, £17,080; increase, £71, or 2½ per cent.

The receipts of the Grand Trunk Railway of Canada for the week ending January 4 were: 1872, £28,900; 1871, £33,000; decrease, £4,100, or 12½ per cent.

CHICAGO RAILROAD NEWS.

Chicago & Pacific.

This company completed just 18 miles of its road west from this city before the first day of January. Since that date the cold has been so severe as to interfere with work. The present terminus of the road is 3 miles east of Elgin. Work will not be resumed until the frost is out of the ground. There is still some grading to be done just this side of Elgin; but it is small in amount, and can be done in ten days. The company has all the material on hand to complete the road to Elgin, and expects to be able to finish it within 30 days after work is resumed in the spring. A passenger car and a locomotive have carried passengers over the finished portion of the road several times already.

The Storm.

The great snow-storm last week interfered with all the railroads centering in Chicago, more or less. The through trains on the Chicago, Burlington & Quincy were not delayed, since they run with but short intervals, and a snow blockade at Mendota, which lasted a day and a night, stopped only the local trains. On the Burlington & Missouri River road, a blockade occurred about a mile in length, where the snow was from 6 to

14 feet in depth. The Chicago & Iowa road was badly blocked with snow for a day or two, seriously interfering with the through trains on the Iowa Division of the Illinois Central. The Illinois Central missed but one train. The Michigan Central, the Lake Shore & Michigan Southern, and the Pittsburgh, Fort Wayne & Chicago ran their cars as usual, with only some delay in their arrivals. The Chicago, Rock Island & Pacific and the Northwestern also came out of the storm with only slight delays.

Chicago, Danville & Vincennes.

This company has just issued orders for the construction of 600 new freight cars and 10 new locomotives, of the first class, which are all to be completed before the first day of May next. The company has now more business than it can do, and has already become, in the business of freight transportation, a first-class road. Its business, both in the transportation of coal and of grain, has very largely increased. The road is well built and is destined to do a very large business, which the company is preparing for by an equipment to meet the demand. The new round-house near Brighton in this city was occupied last week. The machine shops at Danville are finished and will be occupied next week. The injunction against the acquisition of the property for a freight and passenger house in this city has been dissolved; the company have had the old buildings removed from the site, and will commence immediately the construction of a freight house, which will be 260 by 80 feet in size, and is bounded by Carpenter, Fulton and Morgan streets. The walls will be of brick, and the structure will be completed at an early day in spring. The passenger house will not be commenced until some time in summer.

Chicago, Burlington & Quincy.

This company, together with the Chicago & Iowa, has moved its several offices into the building on the corner of Michigan avenue and Randolph street. The second, third, fourth and fifth stories are used. Each floor is separated into two sections by a wide hall. President Walker occupies the front room on the first floor, with his Secretary. The rooms are finely carpeted. Next is the office of the General Superintendent, Robert Harris. Next comes the office of the Assistant General Superintendent, Mr. W. B. Strong. Next to this is the telegraph office. Room 5 is devoted to the uses of the General Freight Agent, General Wadsworth. Room 6 is in the office of the Paymaster and Receiving Cashier. The next room is the private office of the Treasurer, Mr. A. T. Hall. All the offices on this floor are carpeted and fitted with elegant furniture. The third floor has the offices of the General Ticket Agent, the offices of the Chicago & Iowa road, Purchasing Agent and Auditor. The fourth floor has the conductor's room, car department and Chief Engineer's offices. The fifth story is occupied by the Freight Auditor, his clerks and the Stationer.

Chicago, Rock Island & Pacific.

On the 17th ult. Congress finally passed a bill providing that the title to the lands in the State of Iowa, heretofore approved and testified by the Department of the Interior for railroad purposes, to aid in the construction of a railroad from the city of Davenport via Iowa City to Council Bluffs, under the grants made by Congress, according to the adjustment thereof made at the General Land Office, shall be confirmed to the Mississippi & Missouri Railroad Company, and the Chicago, Rock Island & Pacific Railroad Company and their assigns, the corporations to whom the lands were certified. This act is to be construed as conveying only any reversionary or other interest which the United States may have in the lands, and all lands settled upon in good faith and now occupied by homesteads or pre-emption settlers are to be excluded from its operations.

Chicago, Decatur & St. Louis.

At the annual meeting of this company in Chicago, January 21, the time of fulfilling the contract let to Snell, Taylor & Co., for completing the road from Bremen to Decatur, Ill., was extended to January 10, 1874. Active operations, it is reported, will be commenced at once. Considerable grading has been done on the northern end of the line, about 25 miles having been completed or nearly so before the Chicago fire.

Michigan Central.

This road, with its double track and immense network of road in Michigan, brings more freight to Detroit than the Great Western and Grand Trunk together can carry off. The accumulation of freight at Detroit threatens to be so large that the company is obliged in this city to refuse freight which it might otherwise take. This company has added 57 new engines within the past year, and has done all in its power to aid the Canada roads to remove the accumulated freight. For instance, it has loaned the Grand Trunk 6 engines and several to the Great Western. But these roads lack the necessary sidings to enable them to pass the increased number of trains rapidly. The Canada roads are also hindered by the delay in the construction of the International Bridge at Buffalo. This bridge has all its piers built but two, and it is expected now that it will be completed about the first of July. The English board of directors of the Great Western have awakened to the conviction that they must do something to relieve the freight embargo at the West, and have recently voted to put down, next summer, a double track from Glencoe to Detroit. The Michigan Central road could remove 1,500 tons of grain per day if it could get back its cars from eastern points more quickly.

ANNUAL REPORTS.

Old Colony.

The annual report of this company for the year ending September 30, 1872, gives the following statement of its business for the year. The earnings were:

From passengers.....	\$1,141,832 43
" freight.....	644,167 90
" express.....	62,960 41
" rents.....	26,385 86
" mails.....	15,327 23
" miscellaneous.....	6,764 48

Total earnings..... \$1,897,438 09

The expenses were:

Pasenger department.....	\$186,907 23
Merchandise department.....	20,431 57
Locomotive department.....	310,418 47
Maintenance of way.....	302,965 08
General expenses.....	144,755 69
Miscellaneous.....	57,265 23
State, city and town taxes.....	64,445 23 - 1,267,188 55

Net earnings..... \$630,249 54
Balance of income per last report..... 485,039 63

Total..... \$1,115,289 17

Interest on bonds and debt..... \$205,287 44
Two dividends, one of \$3 and one of \$3.50 per share..... 325,000 00
United States tax..... 3,846 15 - 534,133 59

Balance of income account..... \$58,155 52

The increase in gross receipts over the preceding year is \$225,959.58, or 13½ per cent., and the increase in net earnings \$31,013.66, or 5½ per cent. The increase in freight and passenger traffic was nearly uniform, and there was a small decrease

in the items of express, mails and miscellaneous. The gross earnings were at the rate of \$12,566 per mile. The expenses were about 663 per cent. of the gross earnings.

The number of miles run during the year by passenger trains was 740,661; freight trains, 326,959; miscellaneous trains, 43,355; total, 1,110,675 miles, being an increase over the preceding year of 120,013 miles. The trains carried during the year, 3,711,345 passengers, equivalent to 50,820,108 passengers carried one mile; and 510,434 tons of freight, equivalent to 13,934,137 tons carried one mile. Only two passengers have been injured during the year, and those by their own carelessness. The cost per train mile was \$1.14 as against \$1.08 in 1871. Five locomotives, 16 passenger and 146 freight cars have been added to the equipment. The coal traffic of the company, stimulated by a decrease in rates, increased from 46,960 tons in 1871 to 83,284 tons last year. New wharves and coal docks are to be put at Fall River to accommodate this growing traffic.

The earnings of the Cape Cod Division, which were given separately for last year, were \$321,798.38; expenses, \$225,180.83, or 73 per cent. of earnings; net earnings, \$96,637.55. These earnings were at the rate of \$4,022 per mile.

The main line extends from Boston to Newport, R. I., 87.79 miles, with a loop line from South Braintree to Somerset Junction, 37.60 miles, a line from South Braintree to Plymouth, 25.94 miles, and several short branches, making the aggregate mileage 150.71. There are 114 miles of double track and 39 miles of sidings. The Cape Cod Division extends from Middleboro to Wellfleet, 71.62 miles, with branches to Woods Hole, 17.54 miles, and to Hyannis, 4.90 miles, in all 94.06 miles. The Woods Hole Branch was open for only two months of the year. An extension from Wellfleet to Provincetown, 14 miles, is now under contract.

Central of Georgia.

The thirty-seventh annual report of this company gives the earnings of the main line and leased roads as follows:

Central Railroad.....	\$1,656,153 70
Southwestern Railroad.....	896,153 86
Macon & Western Railroad.....	706,616 85

Total..... \$3,258,905 41

Expenses, Central Railroad..... \$966,845 09

Southwestern..... 698,490 32

Macon & Western..... 451,116 51 - \$2,116,441 92

Net earnings..... \$1,149,484 49

Interest on bonds..... \$102,305 00

Rent, Augusta & Savannah Railroad..... 73,000 00

Rent, Eatontown Branch..... 14,000 00

Dividend, Central..... 250,000 00

Dividends, Southwestern..... 369,688 00

Dividend, Macon & Western..... 123,000 00 - \$933,993 00

Balance..... \$308,491 49

Net earnings of bank..... 43,516 56

Total balance..... \$252,006 05

The working expenses were about 65 per cent. of the gross earnings, and the gross earnings were at the rate of \$4,908 per mile. The report states that the net earnings for the past year were not quite equal to the usual dividend, but as the deficit was mainly on the Southwestern Railroad and that company brought a very considerable surplus at the time of its lease, the directors determined to declare the usual semi-annual dividend of \$5 per share. Orders have been given for 1,000 tons of steel and 1,600 tons of iron rails, of which 800 tons of iron rails have already been delivered.

The company purchased last spring six of the steamships running between Savannah and New York, and has since been running them. The earnings and expenses of this line from May 1 to the date of report had not been positively ascertained, but it is believed that this steamer line has been very profitable.

The company's road extends from Savannah, Ga., to Macon, 192 miles, and it leases the Augusta & Savannah Railroad, from Millen to Augusta, 53 miles; the Macon & Western road, from Macon to Atlanta, 102½ miles; the Eatonton Branch, from Gordon to Eatonton, 39 miles, and the Southwestern Railroad, from Macon to Columbus, with its branches from Fort Valley to Albany and Enfaua, in all 274 miles, making a total of 660½ miles of road operated.

Atlantic, Mississippi & Ohio.

This company, which was formed by the consolidation of the Virginia & Tennessee, the South Side and the Norfolk & Petersburg companies, has a line from Norfolk, Va., through Petersburg and Lynchburg to Bristol, Tenn., 408 miles long, with branches from Petersburg to City Point, 10 miles, and from Glade Springs to Salt Works, Va., 10 miles, in all 428 miles of road.

The report of General Mahone, the President, for the year ending September 30, 1872, gives the gross earnings as \$1,963,052.06; the operating expenses, \$1,234,725.14, or 62½ per cent., leaving the net earnings \$734,327.92. The increase in gross earnings over the previous year was \$43,625.01, or 2½ per cent., and in net earnings \$97,190.57, or 15½ per cent. The gross earnings were at the rate of \$4,600 per mile. The earnings were derived from the following sources:

Passenger fare, local..... \$289,923 53

" through..... 183,581 87

Mail service..... \$472,505 39

Express freights, local..... 32,554 98

" through..... 21,553 94

Tonnage transportation, local..... \$580,584 57

" through..... 757,040 15

Passenger fares on trains..... 469 15

Hire of equipment..... 43,608 20

Storage and demurrage..... 4 28

Material trains..... 3,529 70

Miscellaneous sources..... 14,774 70

Total earnings..... \$1,969,053 06

The expenses were for the following purposes:

For Road Department..... \$252,398 41

For Machinery Department..... 248,772 65

For Transportation Department..... 582,998 17

For Treasury Department..... 150,654 91

Divided as follows:

Norfolk & Petersburg Division..... \$276,531 92

South Side Division..... 528,044 85

Virginia & Tennessee Division..... 1,064,476 99

Total..... \$1,934,725 14

The expenses were for the following purposes:

For Road Department..... \$252,398 41

For Machinery Department..... 248,772 65

For Transportation Department..... 582,998 17

For Treasury Department..... 150,654 91

Divided as follows:

Norfolk & Petersburg Division..... 230,496 12

South Side Division..... 309,396 80

Virginia & Tennessee Division..... 694,832 23

Total..... \$1,934,725 14

The of the road, the Norfolk & Petersburg Division has 81, the South Side 133, and the Virginia & Tennessee, 214.

The earnings per mile for the Norfolk Division were nearly

\$4,060 per mile and the Virginia & Tennessee, \$5,070—considerably over the average. The cost per mile of revenue trains was 48.77 cents against 58.61 cents the preceding year, showing a decrease of nearly 17 per cent.

A large amount has been expended on the road in ballasting,

grading, filling up trestle work and putting in new rails. The machine shops at Petersburg have been enlarged, several new

depots built, and on the Virginia & Tennessee Division nearly all the bridges have been renewed. Three locomotives, one mail and express and 148 freight cars have been added to the rolling stock.

The work of surveying the proposed extension to Cumberland Gap has been completed and measures taken to secure the co-operation of the companies which are constructing the lines through Kentucky to the same point.

Lehigh Valley.

At the annual meeting of this company held in Philadelphia, January 21, it was stated that the income from all sources, including interest and income from coal lands, was \$6,434,915, the working expenses \$3,869,637, and the net income \$2,565,228. The total coal tonnage for the year was 3,877,179 tons, of which 27,061 tons was bituminous coal, and 3,850,118 tons anthracite. The total coal tonnage for 1871 was 2,781,509 tons, showing an increase last year of 1,068,609 tons, or 38½ per cent.

The road extends from Easton, Pa., to Wilkesbarre, 101 miles, with branches from Penn Haven to Audenried, 17½ miles, Penn Haven to Hazleton, 31½ miles (including coal branches), Black Creek to Mount Carmel, 5½, and Hazleton to Minisink 17 miles, making in all 225 miles of road. It is extended from Wilkesbarre to the Erie road at Waverly, N. Y., by the Pennsylvania & New York road, which though built and worked by a distinct corporation is substantially owned by the Lehigh Valley Company.

The capital account at the close of the fiscal year is as follows:

Stock, 420,376 shares, par value.....	\$21,468,800
Scrip for instalments received.....	700,830
Hazleton Coal Co. bonds, overdue.....	3,000
Bonds due in 1873.....	703,000
Six per cent. bonds due 1898.....	4,048,000
Seven per cent. bonds due 1910.....	5,000,000

\$31,923,30

This capital account is about \$141,883 per mile. There is no floating debt. The usual quarterly dividends amounting to ten per cent. per annum, were paid during the year.

West Chester & Philadelphia.

The earnings of this road for the year ending October 31, 1872, were: from passengers, \$212,892.01; freight, \$116,195.82; miscellaneous, \$8,751.70; total, \$337,889.53. The expenses were \$207,210.33, or 61½ per cent. of the receipts, and the net earnings were \$130,628.60. The gross earnings, which were at the rate of \$9,517 per mile, showed an increase of \$21,489.34, or 61 per cent. over the preceding year. The road carried 811 passengers and 93,448 tons of freight during the year.

An agreement has been entered into between the preferred and common stockholders to consolidate the stock on the basis of three shares of consolidated stock for two of the old preferred and one share of new stock for one of the old common stock.

A new Howe truss bridge has been erected over Chester Creek, west of Rocky Run, and the new iron bridge over Chester Creek near Glen Mills has been completed. Four hundred and twenty-five tons of new rails have been laid during the year.

The road extends from Philadelphia to West Chester, 26½ miles, and the company leases the West Chester Railroad, from West Chester to the Pennsylvania road, 9 miles, making 35½ miles of track worked.

North Pennsylvania Report.

At the annual meeting of this company in Philadelphia, January 13, the President's report for the year ending October 31, 1872, was presented. The receipts and expenditures for the year were as follows:

Gross earnings.....	\$1,336,923 36
Expenses.....	732,829 27

\$604,109 09

Interest account.....

\$36,624 78

Balance..... \$257,484 31

This balance of net profit is about 7½ per cent. on the capital stock of the company. The interest account includes interest on bonded debt and on mortgages, ground rents, State and municipal taxes. The gross earnings for the previous year were \$1,178,200.23, and the net earnings, \$530,541.29, showing an increase last year of \$158,738.13, or 13½ per cent

that road south through the whole length of the State to Delmar, on the Maryland line, 83 miles. It owns branches from Townsend to Massey's, 9 miles; Seafood to the State line, 6 miles, and Clayton to Smyrna, 1 mile, making in all 99 miles of road. It is extended by the Eastern Shore road to Crisfield, Md., and has several tributary branches, owned by independent companies, which bring it pretty much all the trade of Delaware and the Eastern Shore of Maryland which is carried by rail. A very large portion of this consists of fruit and vegetables shipped to New York and Philadelphia markets.

Boston & Lowell Report.

The annual report of this company shows that the traffic receipts for the year ending September 30, 1872, were \$1,293,969.67, and the traffic expenses \$962,316.66, or 74% per cent. of the receipts, leaving the net earnings \$331,633.01. The increase of traffic revenue over the previous year was \$88,338.25, or 7 per cent. Dividends amounting to 8 per cent. were paid during the year, which required \$178,720.00, and a balance of \$11,859.99 was carried to the sinking and contingent fund. For interest, \$39,456.30 was paid; interest on scrip, \$1,980.00, and rents, \$90,636.72. Under the resolution passed at the annual meeting last year, \$1,000,000 of bonds had been issued, and \$885,500 of this amount had been sold at a premium of 6 per cent., yielding a bonus of \$41,190. These bonds bear 7 per cent. interest. During the year, 928,000 tons of freight had been hauled, and the number of passengers carried is equivalent to 37,000,000 passengers carried one mile. The earnings were at the rate of \$18,485 per mile. Agreements have been made to lease the Petersburgh Railroad, which is an extension of the Wilton Railroad to Greenfield, N. H., 10 miles, and also to lease the Middlesex Central Railroad, an extension of the Lexington Branch to Concord, and a contract has been made with the Massachusetts Central to furnish that road, when completed, terminal facilities in Boston and the use of a track from Boston to Somerville or Arlington. These contracts were submitted to the stockholders at the annual meeting.

Philadelphia, Wilmington & Baltimore.

The report of this company made at the recent annual meeting gives the receipts and expenditures for the year ending October 31, 1872, as follows:

Receipts	\$2,900,900 58
Expenses	1,691,673 28
Net earnings	\$1,208,225 20
Balance, November 1, 1871.	494,849 23
Interest	\$1,703,124 43

Interest \$94,445 07

Two dividends, each 4 per cent 930,218 15

Losses in various ways 17,982 78

Amount to renewal fund for 1873 150,000 00

1,192,646 00

Balance for new fiscal year \$510,478 43

The earnings for 1871 were \$2,762,541.12, showing an increase last year of \$137,467.46, or 5 per cent. The earnings for 1872 were at the rate of \$28,712 per mile. Of the earnings, \$1,633,214.78 was from passengers and \$1,148,429.68 from freight, the remainder being from rents, mail and miscellaneous sources. The principal items of expenditure were: for repairs of road, bridges and fences, \$211,622.81; repairs of locomotives, including \$27,500 for new locomotives, \$124,022.77; repairs of cars, including \$56,522.95 for new passenger and \$83,970.00 for new freight cars, \$283,064.53; fuel, \$118,370.83; passenger department, \$265,734.57; freight department, \$261,663.84; taxes, \$76,282.70. The expenses were 53% per cent. of the gross receipts.

The total cost of the new Darby Improvement is given as \$1,472,652.96, and that of the new terminus on the Delaware at Washington avenue, Philadelphia, as \$76,400.06. Including these sums, the total cost of the road is given as \$11,390,736.59, and adding to their real estate, stocks and accounts belonging to the company, its total property is given as \$14,562,059.87.

The road is 101 miles long from Philadelphia to Baltimore. The company leases and works the Delaware Railroad, but the earnings and expenses of that road are given separately.

New York, New Haven & Hartford.

This company, formed August 6, 1872, by the consolidation of the New York & New Haven and the Hartford & New Haven companies, owns a railroad from Williamsbridge, on the Harlem Railroad, to Springfield, Mass., 124 miles, with branches from Berlin to Middletown, Conn., 10 miles, from Berlin to New Britain, 2½ miles, from Windsor Locks to Suffield, 3½ miles, and from the main track to the freight yard at Hartford, one mile, making in all, 140 miles of road. The company also leases the New Haven & New London road, 50 miles long, between the two places named, and leases the right to run its trains over the Harlem Railroad from Williamsbridge to the depot in the city of New York, 12 miles.

The operations for the year ending September 30, 1872, have been as follows, excluding the receipts from the Shore Line Division (New Haven & New London road) which are given separately. The earnings were:

From passengers	\$3,803,144 81
From freight	1,445,932 00
Mails and express	15,640 25
Miscellaneous	48,816 82
Total	\$4,483,553 88

The expenses were:

Repairs of road, bridges, buildings, rolling stock, etc.	\$1,089,704 57
Fuel and stores	278,734 95
General expenses, wages, etc.	973,659 44
Damages and gratuities	32,722 23
Insurance and telegraph	10,461 63
Taxes	229,717 19
Total	\$2,614,999 99

Net earnings

Interest

Surplus

The expenses were 53% per cent. of the gross earnings, and the gross earnings were at the rate of \$30,709 per mile. During the year, 983,147 miles were run by passenger and 481,763 miles by freight trains, while 3,925,765 passengers and 892,576 tons of freight were transported.

The receipt of the Shore Line Division for the year ending September 30, were:

Expenses

Rent paid

Deficit for the year

The expenses of the division were 80% per cent. of the earnings, and the gross earnings were at the rate of \$7,747 per mile.

The road is now laid for four-fifths of its length with steel rails, and the remainder of the line will be laid with steel during the season of 1873. The equipment of the road now consists of 84 locomotives, 129 passenger, 41 baggage, 1,010 freight and 251 gravel and other cars. The directors report that during the coming year additional accommodation will be provided for passenger business at New Haven and several other points, and additional freight accommodations in New York. The arrangements for using the Grand Central Depot in New York have been completed, and all haulage of cars by horse power is now avoided.

Under the agreement of consolidation the capital stock was to be divided, in the proportion of 57 per cent. to the stockholders of the New York & New Haven and 43 per cent. to those

of the Hartford & New Haven Company. The act authorizing the consolidation limited the capital of the new company to \$15,500,000, the sum of that of the two companies, that of the New Haven being \$9,000,000 and of the Hartford Company, \$6,500,000. In order to equalize the stock it was arranged that one share of the new stock should be issued for each share of the old, and any further interest which the Hartford & New Haven stockholders were entitled to should be paid for in cash. The Hartford & New Haven Company also owned 2,000 shares of its own stock, which was purchased by the new company at its market value and is now held as an asset. The whole amount in cash paid to the Hartford & New Haven stockholders was \$650,790, or \$10.33 to each share. The outstanding bonded debt is \$1,641,500, of which \$2,000 is past due, \$580,000 is due in 1873, and the balance, \$1,059,500, in 1875.

Baltimore & Ohio.

The earnings and expenses of this road, including the lines worked in Ohio and the Parkersburg Branch, for the year ending September 30, 1872, were as follows:

Earnings

Expenses

Net earnings

The expenses were about 61% per cent. of the earnings and the earnings were at the rate of \$14,860 per mile. The earnings for the preceding year were \$12,557,523.42, showing an increase last year of \$1,063,147.89, or 8% per cent. The earnings of the main stem and branches, excluding the Washington and Parkersburg branches and the Ohio lines, were \$10,654,471.62; the expenses, \$6,122,399.93, or 57% per cent., and the net earnings, \$4,532.07. The earnings of the main line were thus at the rate of \$23,468 per mile.

Union Pacific.

The report to the Government made by this company for the year ending June 30, 1872, which has recently been made public, says that subscriptions have been received for 367,830 shares at a par value of \$36,783,000, on which there has been paid in the amount of \$36,762,300. There was received from the transportation of passengers for the year, the sum of \$3,067,808; from the transportation of freight, \$1,122,651; and from miscellaneous sources, \$771,711. The entire cost of the road, the unadjusted balances with contractors included, is, including fixtures, \$114,258,535. The indebtedness of the company is \$75,894,512, including \$27,237,000 of first-mortgage bonds, and \$27,236,512 United States loan.

Central Pacific.

The report made to the Government for the year ending June 30, 1872, has the following information: The amount of stock subscribed is \$59,644,000, and the amount actually paid in is \$54,283,190. The amount received for the transportation of passengers for the year is \$3,620,519; for transportation of freight \$5,753,246. The expenses of the road for the year are \$4,317,332.32. The indebtedness of the company is \$80,900,132, including \$27,855,680 United States Government bonds, \$25,883,000 of first-mortgage bonds of the Central Pacific Railroad Company, and \$9,153,000 of land bonds.

OLD AND NEW ROADS.

South Side of Long Island.

The company has made an authoritative statement of the change of control, in which it is said that the purchasers are anonymous clients of Jacob R. Shepherd & Co., including capitalists in New York and Boston, who secured the control only by negotiating for a majority of the shares of the principal holders, leaving all of the latter still large shareholders. The report that Oliver Charlick was the prime mover in the change is denied. In the new directory six of the thirteen members are new men—John J. Shepherd, Jacob R. Shepherd, Elihu Ford, Walter S. Carter, George William Ballou and Charles H. Dewey.

It is reported that under the new management the company will make its employees virtually its partners, by dividing among them a fixed per centage of the year's profits in addition to their salaries.

Des Moines Valley.

The committee of first-mortgage bondholders announces that the agreement between the holders of the first and second-mortgage bonds of this company has been signed by the holders of about \$2,000,000 of each class of bonds, and that this renders the agreement operative.

St. Croix Land Grant.

The Supreme Court of the United States having decided in the case of the grant of land made to Wisconsin by the General Government, and by Wisconsin conditionally to the St. Croix & Superior Railroad Company, but forfeited by that company by failure to complete its road in time, that Wisconsin has control of this grant for railroad purposes until Congress shall declare default, the Legislature of that State is besieged with propositions to construct a railroad in consideration of the lands. The North Wisconsin, which is pretty much the same in organization as the West Wisconsin, has built 18 miles on or near the old St. Croix & Superior line, and offers to complete the road to Bayfield for the land grant; the Milwaukee & St. Paul offers to construct a new line up the Chippewa River, from its mouth, northeast about 60 miles to Chippewa Falls, with a branch about 20 miles long to Menomonie; the Sheboygan & Fond du Lac would like to take it in exchange for an extension of its road; and the lumbermen, under the lead of Ezra Cornell, promise, it is said, to do all that the Milwaukee & St. Paul offers, and construct besides a line 75 miles long in the Red Cedar Valley.

Portland & Ogdensburg—Vermont Division.

This railroad is now opened for business to Hyde Park, Vt., 50 miles northeastward from St. Johnsbury, and four miles beyond Morrisstown, the last station recorded. No more track is to be laid until spring.

Railroad Subsidies in Nebraska.

An announcement that the Supreme Court of this State has decided invalid bonds issued by towns and counties has been quite generally published in the newspapers. Instead of invalid read valid, and the decision will be correctly reported.

Cairo & Vincennes.

About 200 citizens of Cairo petitioned that this company might be restrained from laying a track in that city on Commercial street, south of Twentieth street. The officers of the company, fearing an injunction, brought in a train loaded with ties, rails and other material on the night of the 18th, and at one o'clock on the morning of the 19th began tracklaying, and before dark on that day had completed the track to Sixth street, about one mile.

Montpelier & Black River.

A correspondent writes: "The preliminary survey for this road from Montpelier, Vt., to North Troy, via Eagle Ledge and Wolcott, has been completed, and a charter obtained. The distance by this route is 74 miles. The road is to be of 3-foot gauge, and ironed with rail of 40lb. per yard. The cost of construction, including side tracks, stations, fences, water stations and contingent expenses, by a liberal estimate is slightly in excess of \$1,200,000 for the entire distance. The survey was

under the direction of J. E. Stearns, C. E., of Manchester, N. H., assisted by C. P. Sabin, S. L. Flanders and S. Darling.

"The people along the route are earnestly in favor of the enterprise, and intend to push it to a successful termination."

Southern Transcontinental.

At a meeting of this company at No. 50 Exchange place, New York, January 22, the agreement to consolidate with the Texas & Pacific Company, made some time ago by the directors, was ratified.

New York & Harlem.

The contract for sinking the tracks and constructing bridges at crossings, called the Fourth avenue improvement, was awarded, January 14, to Dillon, Clyde & Co., but some formalities remain to be settled. Bonds for the proper prosecution of the work are required in the amount of \$800,000.

Mount Alto.

This road extends from Mount Alto Junction on the Cumberland Valley Railroad, 48½ miles southwest of Harrisburg, Pa., south to Mount Alto, a distance of 11 miles. The stations on the road are Brookside, Woodstock, Font Hill, Fayetteville, Pond Bank and Mount Alto. Trains are now running regularly, and the work is substantially completed, except the erection of station houses. The principal traffic is expected to be in iron ore.

La Salle & Chicago.

On the 21st, E. Follett Bull, the President, filed, in the office of the Secretary of State of Illinois, a certificate of the change of name of the La Salle & Chicago Railroad Company to the Chicago & Great Western Railroad Company.

Wilmington & Vincennes.

A corporation with this name filed articles of association with the Secretary of State of Illinois January 21. The capital stock of the company is \$3,000,000. The purpose is to construct and operate a railroad between Wilmington, Will County, Ill., and Vincennes, Indiana, a distance of about 190 miles, a little east of south.

Pennsylvania.

The annual meeting of this company is to be held this year on the second Tuesday of March, instead of February, as heretofore, in accordance with an act of the Legislature.

Pittsburgh papers report that the company is laying a fourth track on its road from Pittsburgh eastward.

Wisconsin Railroad Legislation.

The Wisconsin Senate has adopted resolutions directing its Committee on Railroads to inquire into the advisability of establishing a Board of Railroad Commissioners whose duties shall be to inspect railroads as to their safety, cost and economy of working; inquire into new issues of stock and their objects, report of tariffs, and make a detailed report annually to the Legislature.

Erie.

This company has announced that the privilege of exchanging bonds of the old New York & Erie mortgages for those of the consolidated mortgages is withdrawn. Of this consolidated mortgage of \$30,000,000 some \$23,000,000 were reserved to meet the various existing mortgages as they should mature. The company for a time allowed the converts on to the holders of old bonds, but the market value of the consolidated has improved so as to make the continuance of the privilege disadvantageous to the company. The Executive Committee has therefore determined to stop it. The officers contemplate the substitution of iron for the wooden bridges along the line of the road, as fast as the latter bridges are worn out. Applications have been solicited for specifications and bids in relation to the improvements.

Baltimore, Pittsburgh & Chicago.

Mr. James L. Randolph, the Chief Engineer of the Baltimore & Ohio Railroad, advertises for proposals for graduation, masonry and cross-ties of this road from Defiance, O., westward 120 miles to Walkerton, Ind., on the Indianapolis, Peru & Chicago Railroad, in sections of one mile each. The plans, profiles and specifications for the 73 miles between Defiance and Syracuse are to be seen at Defiance, and for the rest of the line at Laport, Ind.

Boston, Hartford & Erie.

The mortgage bonds of this company fall due in about a month, and a foreclosure is expected. The bonded debt amounts to \$22,500,000, and there is said to be a floating debt of about \$1,000,000. It is reported that the Erie Company will bring suit for foreclosure, claiming a first lien under a contract made in 1867, by which, in return for guaranteeing \$5,000,000 of its bonds, the Erie was to receive the Boston, Hartford & Erie earnings from coal, for which the latter was to provide an equipment capable of carrying 300,000 tons by 1870, and make close running arrangements with the Erie.

Lake Erie & Louisville.

The stations and distances from Fremont, O., on the recently completed section of this road are: Winter's, 7½ miles; Kansas, 11; Amherst, 14; Fostoria, 20; Arcadia, 26; Findlay, 35; Lawson, 43; Bluffton, 50½; Beaver Dam, 56½; Lima, 66. The grading and bridging from Lima to St. Mary's, 20 miles, is completed, and the rails have been purchased.

Southeastern of Utah.

This recently organized company proposes to build a railroad, of three-feet gauge, from Springville, on the Utah Southern, through the San Pete and Castle valleys to the Sevier River. Coal is said to be abundant in both the San Pete and Castle valleys. Surveys are now being made, and the company expects to commence work as soon as the season will permit. William Jennings, of Salt Lake City, is President; Mayor Smoot, of Provo, Vice-President, F. Fuller, Treasurer, L. S. Hills, Secretary, and L. H. Short, Chief Engineer.

Utica & Black River.

The track has been laid on the extension of this road from Carthage, N. Y., north to Philadelphia, about 15 miles. From Philadelphia to Theresa, eight miles farther, the track has been laid for some time. Trains will run through from Utica to Theresa in a few days. At Theresa the new road will fork, one branch going west to Clayton, the other northeast to Morris.

Hoosac Tunnel Railroad.

A bill has been introduced in the Massachusetts Legislature to consolidate the Fitchburg, the Vermont & Massachusetts, and the Troy & Boston railroads, and the interest of the Commonwealth in the Troy & Greenfield road, the Hoosac Tunnel & the Southern Vermont road. The bill provides that if the Fitchburg road neglects or refuses to pass a vote to unite with the other companies, the consolidated corporation comprising the other roads shall have authority to extend its road to Boston; it shall be the duty of the Commonwealth at its own expense to complete the Hoosac Tunnel, and lay a track through the same ready for use, and also to lay and finish the Troy & Greenfield Railroad west of the Tunnel, so that the same shall be fitted for the passage of through trains; the capital stock to be fixed by the corporations and the Governor and Council, not however, to exceed \$25,000,000; the Governor and Council to appoint four of the directors; upon the election of directors the consolidated corporation shall have and possess all the estate and in-

terest of the Commonwealth in the Troy & Greenfield road, the Hoosac Tunnel & Southern Vermont road. The new corporation is to be called the Hoosac Tunnel Railroad Company, and is empowered to purchase the property and franchise of the Cheshire Railroad; and the Vermont & Massachusetts Company is authorized to sell that portion of its road from Miller's Falls to Brattleborough, and any other corporation is authorized to purchase the same.

Poughkeepsie Bridge Company.

This company, which proposes to build a suspension bridge across the Hudson River at Poughkeepsie, N. Y., at a recent meeting appointed commissioners to open books of subscription to the capital stock. It was also resolved to make further surveys of the bed of the river and the approaches to the bridge.

Elkton & Oxford.

Surveys have been made for a road of three-feet gauge from Elkton, Md., on the Philadelphia, Wilmington & Baltimore, north about 18 miles to Oxford, Pa. The estimated cost of the road is about \$60,000! It is to connect with, and form an extension of, the Peck Bottom Railroad, now under construction.

Syracuse & Chenango Valley.

This road is to be opened for travel from Syracuse, N. Y., southeast to Earville, 27 miles, February 1. It is intended to connect with the New York, Kingston & Syracuse road, and to form the western end of that line.

Central Valley.

This narrow (3-feet) gauge road is now running from Bainbridge, N. Y., on the Albany & Susquehanna, north 12 miles to Smithville Flats. It is purposed to extend it to McDonough, 12 miles farther, next season.

Cumberland Valley.

It is reported that the Pennsylvania Railroad Company, which owns a controlling interest in this road, is about to do away with its separate organization and operate it under the same management as its own line, making it merely a division of the Pennsylvania Railroad.

Warren & Venango.

The laying of the tracks on this road into the city of Titusville, Pa., has again been stopped, this time by an injunction prohibiting the laying of tracks on a public street. The case was to have been argued January 27.

Rutland.

The St. Albans (Vt.) Messenger denies the truth of the rumors that the Delaware & Hudson Canal Company has purchased this road, or that the lease of the road to the Vermont Central has been assigned to the Delaware & Hudson Company.

Montpelier & Rutland.

Steps have been taken to organize this company under the charter recently granted by the Vermont Legislature. The road is to extend from Montpelier, Vt., southwest to Rutland, about 70 miles.

Jersey Shore, Pine Creek & Buffalo.

This road is intended to run from Williamsport, Pa., west up the Susquehanna to Jersey Shore, thence northwest up Pine Creek into Tioga County, and then west through Potter County to Port Allegheny, on the Buffalo, New York & Philadelphia road. The length of this road will be 110 miles, and it is also proposed to build a branch, about 45 miles long, to Hornellsville, N. Y. It is reported that the Philadelphia & Reading Company has become interested in the road and will build it as a western extension of the Catawissa road.

Mississippi Valley & Western.

On the 28th of January the consolidation of the Mississippi Valley Railroad Company and the Clarksville & Western Railroad Company with the above company was consummated under the above name. The line of the consolidated company extends from Mississippi River Bridge in St. Louis via Clarksville, Hannibal and West Quincy, Mo., to Keokuk, Iowa, and west from Canton, Mo., to the Missouri River, and the length of main line and sidings is to be 453 miles. The company intends to complete its line from West Quincy to St. Louis by August 1 next, the road being already in operation between Keokuk and West Quincy.

Dividends.

The Milwaukee & St. Paul pays 3½ per cent. on the preferred stock February 15. Books will close on the 5th, and reopen on the 17th.

The Pacific Railroads in Congress.

A bill has passed the Senate which directs the Secretary of the Treasury to withhold enough of the amount due the companies for transportation, &c., to pay the interest due upon the bonds lent to the roads, and also the 5 per cent. of the net earnings which is by law to be applied as a sinking fund, and gives the companies a right to sue for the amount they demand in the Court of Claims, with the further right of appeal to the Supreme Court. It also directs the Court to give an opinion not only on all questions decided, but also on all points which are raised in the answer of the Government, and gives the suit to be brought precedence of all others to be brought in both courts.

New York, Boston & Montreal.

The stockholders of the New York, Boston & Northern and the Harlem Extension Companies have voted to consolidate the two companies under this title. The new company now owns a line from the Harlem River north to Lake Mahopac and thence west to Brewster's on the New York and Harlem road, on which most of the grading is finished and some seven miles of track (from Lake Mahopac to Brewster's) laid; a line (formerly the Dutchess & Columbia) from Fishkill northeast to a junction with the Connecticut Western and Harlem roads at Millerton, 59 miles; and a line (the Harlem Extension) from Chatham Four Corners, the terminus of the Harlem road, north to Rutland, Vermont, 108 miles, making 174 miles of completed road and 45 miles under construction. To complete this system it is required to construct a new road from Lake Mahopac north to the Dutchess & Columbia road, about 15 miles, and from Millerton north about 30 miles to Chatham Four Corners. The company will then have a line from New York to Rutland, Vt., 235 miles long, with branches to the Connecticut line near Brewster's and to the Hudson River at Fishkill, the former about seven and the latter 12 miles long, making in all 254 miles of road. That part of the Harlem Extension road which lies in the State of Vermont was sold at Bennington, Vt., January 20, under foreclosure of mortgage. It was purchased by Mr. C. G. Lincoln of Bennington, for \$25,000, in addition to the mortgage debt, interest and costs.

National.

Both houses of the New Jersey Legislature have appointed committees to investigate the circumstances attending the passage of the Stanhope Railroad charter last year. It will be remembered that all sorts of fraud were charged by the opponents of the bill.

Hudson & Delaware.

This company proposes to build a railroad from a point between Jersey City and Bergen Point, on New York Bay, to the Delaware River near Trenton, and to establish a ferry between the terminus of the road and New York. The capital

LOCOMOTIVE RETURNS, AUGUST, 1872.

Master Mechanics of all American railroads are invited to send us their monthly reports for this table.

NAME OF ROAD.	MILEAGE.	No. of Miles Run to			Cost per Mile, in Cents.	Average Cost of					
		Passenger.....	Freight.....	Miscellaneous.....			Total.....	Repairs.....	Fuel.....	Stores.....	Oil, per gallon.....
Burlington & Missouri River.....	67	53,859	105,116	53,235	212,230	41.39	94.00	14.79	3.56	6.26	4.00
Chicago & Northw'n (Wis. & Mil. Div.).....	66	70,890	87,181	48,054	206,125	33.96	12.48	12.38	0.99	8.52	3.47
(Madison Div.).....	15	13,569	16,056	19,293	48,920	36.37	1.74	12.68	0.88	6.58	22.03
(Milwaukee Div.).....	67	49,334	78,882	36,612	164,828	36.79	6.62	9.67	0.95	8.75	28.19
(Iowa Div.).....	71	47,522	75,121	37,045	159,891	37.31	7.88	9.47	0.89	8.46	26.98
(Peninsular).....	21	9,148	13,716	22,077	63,921	45.42	0.97	10.11	0.77	6.23	18.15
Chicago, R.R. Isl. & Pacific (Ill. Div.).....	79	26,606	169,403	4,982	204,271	45.59	19.00	3.02	6.22	0.50	3.50
" " " (Iowa Div.).....	107	78,545	46,531	41,914	143,262	43.26	14.75	4.02	6.00	0.57	6.84
Cincinnat., Lafayette & Chicago.....	475	132	72,268	209,991	107,423	369,692	50.35	20.20	2.72	5.03	15.44
Cleveland & Pittsburgh.....	77	21,906	63,235	21,209	106,176	45.25	8.61	2.41	4.46	0.72	2.25
Denver Pacific & Boulder Valley.....	9,784	4,540	3,362	17,683	51,17	14.69	2.82	7.14	0.64	7.55	18.15
Flint & Pere Marquette.....	33	20,948	20,584	65,706	63,43	6.28	2.98	7.10	0.76	7.75	18.51
Kansas Pacific.....	61,572	91,928	45,306	198,806	39.55	18.02	6.40	9.55	0.63	7.18	23.78
Lake St. & Mich. S. (B. & M. Div.).....	84	23,700	112,650	68,080	201,433	57.40	20.10	4.60	6.00	6.38	16.90
" " " (Erie Div.).....	76	41,500	129,257	48,216	217,412	55.00	37.00	17.04	5.29	6.74	19.25
(Pitts'burg Div.).....	164	123,815	188,273	492,336	44,18	27.53	5.18	7.12	0.62	5.37	17.87
Leavenworth, Lawrence & Galveston.....	18	17,641	17,605	3,840	39,086	74.17	28.42	5.55	5.70	6.44	4.00
Missouri River, Ft. Scott & Gulf.....	14	.....	.....	.....	41,930	69.30	16.10	4.44	6.99	0.77	7.32
Marquette, Houghton & Ontonagon.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.00
Pacific, of Missouri.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pennsylvania (New York Division).....	99	143,537	162,373	7,720	233,650	44.23	40.16	8.85	5.20	15.40	1.30
(Albany Division).....	45	56,867	51,932	5,041	113,860	50.81	53.14	12.58	7.60	11.30	1.00
(Philadelphia Division).....	32	22,632	29,627	4,425	56,134	44.48	49.50	13.55	9.40	14.10	1.39
(Middle Division).....	123	74,362	29,262	12,232	323,560	33.66	17.54	5.40	5.30	7.90	1.16
(Pitts'burg Div., E. End.).....	120	58,279	251,439	12,543	120,233	32.23	22.22	4.50	5.40	5.70	0.98
(Pitts'burg Div., W. End.).....	36	13,466	136,566	6,113	156,120	17.17	7.00	6.90	1.00	15.00	0.96
(Tyrone Division).....	105	60,342	171,827	14,825	246,994	37.36	16,39	2.20	5.00	20.00	1.00
(West Penna. Div.).....	26	11,205	36,006	3,297	50,598	29.41	23.64	9.10	4.00	16.00	0.66
(Lewistown Division).....	21	16,817	3,346	3,850	54,013	42.45	37.31	5.00	4.49	9.80	0.52
" " " (W. Div.).....	8	10,061	5,737	1,537	17,455	49.96	21.01	4.70	3.70	6.00	0.06
Pitts'burg, Ft. Wayne & Chic. (E. Div., W. Div.).....	319.2	149	82,398	319,403	9,996	411,797	43.60	15.09	3.10	5.53	0.86
South Carolina.....	209	100	84,937	187,589	23,07	205,553	78.50	29.90	17.75	5.50	9.30
.....	34	15,328	39,078	12,197	66,600	.....	57.62	31.63	7.14	4.21	0.74
Louisville & Nashv. (Main Line).....	386	86	66,716	127,438	7,087	201,241	38.36	12.02	8.04	11.07	0.71
(Clarksville Div.).....	124.4	5	.....	6,336	2,530	8,866	18.00	15.50	19.02	15.27	0.45
(Memphis Div.).....	150.4	18	19,529	19,227	4,553	43,309	33.10	13.20	5.89	9.82	0.63
(Decatur Div.).....	122	16	16,788	8,528	1,410	26,726	35.18	14.32	6.43	16.13	0.73

* Switching Engines allowed six miles per hour

† 0.74 lbs. sand used per mile run.

stock is to be \$5,000,000, with privilege of increasing to \$10,000,000, and the incorporators named are: John McGregor, Jeremiah Cleveland, Jonathan Roberts, William A. Nowbold, Thomas N. Black, Wm. L. Dawes, Walton Newbold, Jas. B. Dayton, John H. Patterson, Joseph J. Read, Christopher O. Bergen, Adam Eaton, Caleb Rogers and Samuel Prior. This is the third project for a new line between New York and Philadelphia now before the New Jersey Legislature.

Baltimore & Ohio.

It is said that the company intends to lay a third track from Baltimore to Cumberland, 178 miles. Work has already been commenced on the grading at several points.

A number of residents of Baltimore have protested against the use of locomotives by the company on Pratt street in that city. The City Council has ordered the company to discontinue their use on that street altogether.

Ashtabula, Youngstown & Pittsburgh.

The opening of this road has been delayed by an injunction prohibiting the company from using five miles of road from Youngstown to Girard. This section of the road was built by the Liberty & Vienna Railroad Company and sold by it to the Ashtabula, Youngstown & Pittsburgh Company. It is claimed the \$100,000 of the purchase money is due and has not been paid.

Cuyahoga Valley.

The contract for grading the road from Akron, Ohio, south to Canton, 22 miles, has been let to Van Sickle & Conger for about \$120,000.

Detroit & Indianapolis.

This new company purposes to construct a railroad from Indianapolis northeast 80 miles to Huntington, on the Toledo, Wabash & Western road. The capital stock is to be \$1,000,000.

Columbus & Hocking Valley.

This company has resolved to build two branches, one up Monday Creek and another on Snow Fork. These branches are intended for coal traffic.

Mineral Range & L'Anse Bay.

This company has succeeded in disposing of \$70,000 of its bonds in Marquette and Houghton. Work is to be resumed as soon as the weather permits.

Saginaw Valley & St. Louis.

The cost of this road, which is 34 miles long, is reported to have been, for the road, \$410,000, and for buildings and equipment, \$81,775, making in all \$491,775, or \$14,464 per mile. The company has three locomotives, two passenger and 52 freight cars.

Flint & Lansing.

The line of this road has been surveyed from Flint, Mich., the present terminus of the Port Huron & Lake Michigan road, southwest through Vernon, Newberg and Pine Lake to Lansing. The distance is about 50 miles.

Mobile & Ohio.

The board of directors has been considering the question of increasing the capital stock of this company. It is proposed to make the stock \$8,000,000 instead of \$4,000,000, and to make a call or assessment on the stockholders of \$25 on each share. On the receipt of this amount, one share of new stock would be issued for every share of the old stock. The stock now sells at about \$40, the par value being \$100. It is hinted that this scheme is intended to enable a few large stockholders to absorb the stock of the small holders, though how this could be done is not very clear. No definite action has been taken, but the board is understood to be in favor of the increase.